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ABSTRACT

The publication is part of a consolidated bibliography which lists all technical reports issued since 1949 by Navy personnel research organizations in San Diego and Washington, D.C. Abstracts are included where readily available from past records. The overall bibliography is divided into four volumes for handling convenience, with classified and unclassified reports listed separately. Reports are listed in the publication in appropriate subject categories for reference convenience: manpower management, personnel administration, training and education, human factors support, resource costs, and bibliography reports. An author index is provided. Information is given for ordering documents listed in the bibliography. (Author)

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CONSOLIDATED BIBLIOGRAPHY - NAVY PERSONNEL AND TRAINING RESEARCH
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This publication is part of a consolidated bibliography which lists all technical reports issued since 1949 by Navy personnel research organizations in San Diego and Washington, D. C. Abstracts are included where readily available from past records. The overall bibliography is divided into four volumes for handling convenience. Classified and Unclassified reports are listed separately. Each volume covers a time period of approximately ten years as outlined below: (over)

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Volume III - Unclassified Reports, FY 1964 - FY 1973
Volume IV - Classified Reports, FY 1964 - FY 1973

Within each volume, reports are listed in appropriate subject categories for reference convenience as follows:

Manpower Management
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SUMMARY

This publication is part of a consolidated bibliography which lists all technical reports issued since 1949 by Navy personnel research organizations in San Diego and Washington, D. C. Abstracts are included where readily available from past records.

The overall bibliography is divided into four volumes for handling convenience. Classified and unclassified reports are listed separately. Each volume covers a time period as outlined below:

Volume I - Unclassified Reports, FY 1949 - FY 1963
Volume II - Classified Reports, FY 1949 - FY 1963
Volume III - Unclassified Reports, FY 1964 - FY 1973
Volume IV - Classified Reports, FY 1964 - FY 1973

In past years, certain reports were first published locally by the originating activity and subsequently reissued by the Personnel Research Division of the Bureau of Naval Personnel (BUPERS). In such cases, the BUPERS printing is normally noted in lieu of the local listing to avoid redundancy.

Reports are listed in appropriate subject categories for reference convenience. The scope of each category is defined below for bibliography purposes.

1. Manpower Management - Involves overall planning and management of Navy manpower resources on broad-scope aggregation basis. Includes consideration of major organization functions/configurations, career patterns, rating structure, and occupational specialty codes. Includes conduct of studies for identification of occupation (rating) characteristics and standards. Includes development of performance qualification standards based on specific job requirements. Covers analysis of work methods and productivity. Also, covers the development of computer simulation models related to forecasting and allocation of manpower resources.

2. Personnel Administration - Involves detailed personnel administration functions such as determination of specific duty assignments and evaluation of individual qualifications for advancement in rating. Includes consideration of factors affecting recruitment, retention, and morale. Covers functions related to measurement of aptitudes and capacity, facilitating classification of personnel in various ways for training and career development purposes. Involves detailed consideration of psychological aspects of human behavior, including the effects of motivation and attitude on individual performance and organizational effectiveness. Covers all areas of human relations. Includes conduct of various types of opinion surveys. Includes study of minority problems affecting career opportunities.

3. Training and Education - Involves design and evaluation of training curricula and procedures. Includes analysis of operation/maintenance task characteristics to facilitate development of valid training objectives. Includes experimental application of innovative training methods and media such as programmed instruction and computer-assisted instruction. Covers training feedback studies involving evaluation of job-related performance capabilities and requirements. Also, covers the development of correspondence courses and other self-instruction approaches.

4. Human Factors Support - Involves analysis of personnel and training requirements associated with developmental weapons hardware and logistics support systems. Includes identification of man/machine (human engineering) interface implications. Covers the development of new approaches for improvement of manning/training predictive techniques. Also, covers evaluation of manning/training adequacy under operational test and evaluation (OPEVAL) conditions.

5. Resource Costs - Involves determination of costs associated with various aspects of manpower planning and personnel utilization. Includes identification of costs by rating, pay grade, and occupational specialty categories. Covers all cost factors (recruitment, clothing, medical, retirement, etc.). Includes determination of projected life cycle costs associated with specific organizational functions/configurations and work operations.

6. Bibliography Reports - Covers bibliography listing of technical reports published by Navy personnel research organizations in San Diego and Washington, D. C. since 1949.

Requests for copies of reports should be addressed to the Defense Documentation Center, Cameron Station, Alexandria, Virginia 22314. The DDC accession number (AD) should be included for each requested document where the number is identified as part of the bibliography listing. Reports which do not have "AD" numbers and are not stocked by DDC may be available upon request to the Navy Personnel Research and Development Center, San Diego. Certain older reports may be out of stock at this time. Other reports, particularly those denoted by an asterisk, are available only on a temporary loan basis due to the limited quantity remaining in stock.

The original publication source is indicated in some cases by an abbreviation designator, with "SD" for San Diego and "W" for Washington, D. C. The publication activity may also be indicated by a letter designator incorporated as part of the alphanumeric report number (where the number is available), with the letter "S" denoting San Diego and "W" referencing Washington, D. C. Where a NAVPERS report number is indicated, the publication source is denoted as the Bureau of Naval Personnel, Washington, D. C.

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MANPOWER MANAGEMENT

Compilation of Enlisted Ratings and Apprenticeships, U. S. Navy, 1775 to the Present. July 1963. (W).

This report contains a history of enlisted ratings and apprenticeships which have existed in the Navy from 1775 to 1963. Included in this report are historical notes on the evaluation of rates, ratings, and other occupational entities utilized to describe naval careers.

Preliminary Personnel Predictions for the Atlantic Undersea Test and Evaluation Center Data Processing Facility. Report No. ND 64-1(N). Personnel Research Note. July 1963. 7 pp. (W).

Contains recommendations for an organizational structure and manpower requirements for the first increment data processing facility of the Atlantic Undersea Test and Evaluation Center.

Relationship of Restricted Line & Staff Corps Officer Specialities to Subspecialization Categories. PRAW RS 63-13. July 1963.

This is the fourth of the planned series of research reports concerning Unrestricted Line Officer Subspecialization. It has been developed to extend the first reports by relating the Restricted Line and Staff Corps officer specialities to the Unrestricted Line Officer Subspecialties.

Staffing Criteria for Naval Functions and Criteria Ratings. RS 63-8. July 1963. (W).

This report evaluates the criteria and application of guidelines for determinations as to the numbers and types of electronics maintenance personnel required for manning fleet units.

Staffing Criteria for Naval Functions and Criteria Ratings. PRAW Report No. 63-18. July 1963.

A staffing guide to provide assistance to manpower allocators and planners in their determinations as to the number and types of Electronics Technicians and supervision and support manpower required for the maintenance of electronic equipments assigned and for their manning in fleet units. This is a revision of Report No. 62-26.

Report on Preliminary Study of Feasibility of Billet Re-Engineering of RD and RM Ratings. PRASD Report No. 216. August 1963. Russell V. May, Jr.

This report presents the findings of a preliminary study outlining a number of approaches and administrative steps that could be taken to bring about greater utilization of Radarmen (RD) and Radiomen (RM) in preventive and corrective maintenance functions. It also reviews the changes which would be required if the responsibility for preventive and corrective maintenance were transferred to the RD and RM ratings, discusses some of the problems which would be resolved and some which would be created, and offers some alternative actions which should be considered.

Research Report on Method Development for Manning Requirements Surveys. PRASD Report No. 221. September 1963.

This report presents the results of the first phase of this research which is a draft of a handbook containing instructions and procedures for conducting manning requirements surveys. The next phase of this research will consist of trial application and validation of the procedures.

Research Report on the MT Rating. PRASD Report No. 220. September 1963. Joseph R. Heinzel.

This report presents findings of a research study to explore the validity of a concept that the current trend toward less testing of missiles aboard ship might eliminate the requirement for the Missile Technician (MT) rating within the next few years. This report presents several alternatives for restructuring the MT rating, with a recommendation that, from the standpoint of both present and future requirements, a merger of the current MT and FTM ratings to form a new rating (called "MX" in this report) would appear to be very desirable.

A Staff Study of Unrestricted Line Officer Designations. PRAW. September 1963.

This staff study considers the Navy's need for the development of a new designation classification coding structure (designators) especially for Unrestricted Line Officers, USN.

Operational Analyses of the Naval Personnel System: Part III, Development of the Enlisted Personnel Simulation System. American Institute for Research. October 1963. (W).

Included in this report is a summary of research by the American Institute for Research to explore the application of operations research techniques to the Navy Personnel system. It also contains a description of the simulation system which has been developed and is being placed into operational use.

The CAPRI System: Volume I - Design and Operation, Report No. ND 64-30. November 1963. 159 pp. Volume II - Computer Program Specifications. Report No. ND 64-31. November 1963. 161 pp.

CAPRI (Computerized Advance Personnel Requirements Information) encompasses the manpower management functions involved in the complete life cycle of a personnel subsystem for a new naval weapon or support system, spanning the period from the issuance of a General Operational Requirement through final phase-out of the last operational model of the system. Two distinct CAPRI subsystems have been designed, the Billets and Inventory (B&I) subsystems and the Network Planning and Analysis subsystem. The system has been designed and pilot tested.

Staff Paper on "Non CW" Requirements in Radioman (RM) Rating. PRAW. November 1963.

This research memorandum contains findings of a study conducted to determine those "non-CW" clerical advancement qualification items for the Radioman (RM) rating which might be performed by other ratings. The study was prepared at the request of the Permanent Board for Review of the Enlisted Rating Structure for use in connection with its study of a possible revision of the RM rating structure.

Handbook for Enlisted Qualifications Analysis. PRAW. Report No. 63-15s. December 1963.

Prepared for guidance of personnel concerned with development, review, and revision of enlisted qualifications for advancement to the end that they may be consistent and in conformance with established principles and concepts. Other information of general interest is included in Appendix.

Research Report on Revisions of Advancement Qualifications for the Gunner's Mate Rating. PRASD Report No. 227. December 1963. Joseph R. Heinzel, Harold W. Croulet, and Gordon M. Campbell.

This report contains a description of the approach used in this research, a discussion of the major changes in the Gunner's Mate (GM) qualifications for advancement in rating, and a description of the principles and concepts of advancement qualifications which were followed in this research. In addition, the report contains a detailed listing of the rating scope revisions and disposition of qualification items.

A Survey Report on the AD, AM, AE, AQ, PH, and AC Ratings. PRASD Report No. 225. December 1963. Richard D. Conner, Oscar B. Holt, and Lorne H. Smyth, LT, USN.

This report describes the results of a preliminary research survey on six aviation ratings. The purpose was to determine whether or not comprehensive research on the rating structure and/or other components of the enlisted career system was necessary for any of these ratings. The results of the survey indicated that some revisions in advancement qualifications, NEC's, etc., were required at this time for a few of the ratings, but that further research was necessary only on the AM rating.

Recommended Changes to Officer Designators (Unrestricted Line). PRAW RS 64-2. January 1964.

This is the third, and final, research report of a planned series of reports concerning the problem(s) inherent in Recommendation MPWR No. 14 of SECNAV Instruction 5430.59 (Dillon Report). The report contains recommendations concerning the officer designator structure intended to overcome unacceptable limitations.

A Review of the Development of DOD Officer Occupational Conversion Table (Subtitle: Research Memorandum of Information Demands on the Navy Officer Classification System/Department of Defense Needs). PRAW Report 64-1. January 1964.

This series, when completed, will provide an enumeration of classification system needs and uses of the various manpower management agencies and a report of ongoing research on an improved officer classification system.

Impact of Senior Command and Control Billets on Officer Qualifications. Report No. ND 64-42. Personnel Research Memorandum. February 1964. 11 pp. (W).

Identifies officer qualifications in terms of fleet experience and specialized education to fill senior command and control billets. The billets include (a) Strategic and/or Policy, (b) Tactical, and (c) Operational and/or Technical.

MT Conversion Training Evaluation. Report No. ND 64-39(N). Personnel Research Note. February 1964. 12 pp. (W).

This Personnel Research Note is a review of the MT/NWA Conversion Program which included 50 conversion candidates. Evaluation of the academic and on-the-job training for this program is included with appropriate recommended actions concerning MT conversion training and selection of candidates.

Proposed Qualification Requirements for U. S. Naval Officers to be Designated as Subspecialists (Unrestricted Line). PRAW Report No. 64-5. February 1964.

This report develops proposed criteria for the identification and evaluation of officer formal education, functional training, civilian experience and billet experience in order to designate Unrestricted Line Officers as subspecialists in a particular field of naval endeavor, other than naval warfare, and to show the degree of expertness required of an officer in his subspecialist area.

Research Report on Development of a Standard Enlisted Training/Classification Coding Structure. PRAW Report RS 63-25. February 1964.

This report presents the findings of research conducted to determine the requirements for the establishment of a Navy Enlisted Training Classification/Coding Structure (NETC) for optimum identification of graduates from enlisted Navy schools so designed as to achieve close relationships between school codes and NEC's through the use of a common coding system of priorities and a defined meaning for significance in relation to courses and billets.

SSB(N) Weapons System Personnel Statistics. Report No. ND 64-50. Personnel Research Memorandum. February 1964. 30 pp. (W).

This is a statistical comparison between the April 1963 to 1 January 1964 enlisted personnel input to the FBM Program and the personnel input for the period December 1962 to April 1963.

Tentative Staffing Criteria for Weapons and Deck Functions on Aircraft Carriers (CVS-10). PRAW Report No. 64-9. February 1964.

This report, covering Weapons and Deck function (Afloat), is one of a series of reports being prepared to present tentative criteria for determining the quantitative/qualitative requirements, on a functional basis, of criteria ratings afloat.

Manning Requirements for Naval Shore Functions. PRAW Report No. 64-23. March 1964.

This report presents, in the form of staffing criteria, recommended quantitative and qualitative manning requirements for functions performed ashore.

Organization Planning for Naval Units. NAVPERS 18371. PRAW Report No. 64-26. March 1964.

This report updates and revises the preliminary edition of Organization Planning for Naval Units, NAVPERS 18371, 1955, to reflect its applicability by command and supervisory personnel assigned to the ship and shore activities of the Navy through improvements in reading ease and organization of the material.

Proposed Draft of Handbook for Manpower Validation Surveys. PRASD Report No. 230. March 1964. Randall F. Whitehead.

This is the final draft of a procedures handbook for the guidance of the Manpower Validation Survey Teams, (established by the Chief of Naval Operations, OP-102), in conducting shipboard manpower surveys.

Proposed E-8 and E-9 Advancement Qualifications for the Aviation Ratings. PRASD Memorandum Report No. 64-8. March 1964.

This report presents preliminary E-8/E-9 advancement qualifications for all compressed and non-compressed aviation ratings, developed in accordance with E-8/E-9 rating compressions as recommended by the Permanent Board for Review of the Enlisted Rating Structure.

Proposed Revisions of Tradevman (TD) NEC's. PRASD Memorandum Report No. 64-7. March 1964. Oscar B. Holt.

This memorandum presents the findings of a study on the current applicability of the eight NEC's of the TD rating in terms of criteria for establishment or retention of NEC's contained in Manual of Navy Enlisted Classifications, NAVPERS 15105 (series F).

Research Report on Officer Subspecialty Classification Coding Structure (Development of New Officer Classification Coding Structure). PRAW Report 64-3. March 1964.

This report is the second of a planned series of this fiscal year dealing with requirements for classification system information for reference purposes, the first report (No. 64-1) was concerned with DOD information requirements.

Research Report on Shipboard Operational Manning Requirements. PRAW Report No. 64-24. March 1964.

This report presents, in the form of staffing criteria, recommended quantitative and qualitative manning requirements for functions performed afloat.

Research Report on Shipboard Support Function Manning Requirements. PRAW Report No. 64-25. March 1964.

This report presents, in the form of staffing criteria, recommended quantitative and qualitative manning requirements for functions performed afloat.

Staff Study of Naval Reserve Officer Professional Development System. PRAW. March 1964.

This staff study outlines the scope and detailed procedures for the development of a Naval Reserve Officer Professional Development System.

Staff Study of Requirements for 11XX and 13XX Officers. PRAW Report No. 64-22. March 1964.

A brief outline of problems, connected with the identification of Unrestricted Line Officer billets, recommending research approach leading to solution of these problems and a schedule for phasing and completion of research.

Third Progress Report for Research on Forecasting Retention Rates of Personnel in Technical Ratings. PRASD Memorandum Report No. 64-4. March 1964. Everett E. Johnston, Jr.

This is the third of a series of progress reports pertaining to research being conducted to develop retention rates for specific ratings. Subject report discusses work accommplished on planning specific data processing procedures, such as the determination of the format and design of data collection instruments, the coding and data conversion processing requirements, and the determination of the most accurate sources of information for each variable to be correlated with retention rates. In addition, subject report discusses findings of a comparative analysis of information contained in service records with that recorded on the enlisted Master Tape in order to identify discrepancies between the two. One or more discrepancies were discovered between the records of about 66% of the sample, with 555 total discrepancies.

Proposed Pattern for Use in the Naval Reserve Professional Development System. PRAW Report No. 64-31. April 1964.

This report provides the basic elements of a model for use in the design and construction of professional development patterns for the Naval Reserve Officer Professional Development System.

Recommendations for Presenting and Promulgating Navy Staffing Criteria. PRAW Report No. 64-21. April 1964.

This report presents information and recommendations regarding the publication and contents of naval staffing criteria promulgated in the U.S. Navy Staffing Criteria Manual, OPNAVINST P5310.5.

Results of Second Biennial Group IX Questionnaire Survey. PRASD Report No. 231. April 1964. Richard D. Conner.

This report presents findings of a survey which was designed to provide the Chief of Naval Operations and other Navy bureaus and offices, as appropriate, with information concerning the adequacy of aviation training programs, the Group IX rating structure, the distribution of aviation personnel, and other personnel management practices.

Preliminary Research Report on Determining Striker Requirements for Navy Ratings. PRASD Report No. 235. May 1964. Richard D. Conner.

This report is the first of a series dealing with the development of improved methods for determining striker ratios for Navy ratings. It presents striker ratios which have been developed for six ratings (RM, RD, MT, ET, FT, and AT) in various formats and under several sets of assumptions so as to afford the Chief of Naval Personnel the opportunity to designate the most suitable of these for use in developing ratios for the remaining ratings.

Quantitative Staffing Criteria for Supply Department Ratings on Aircraft Carrier (CVS-10). PRAW Report No. 64-7. May 1964.

This report, covering the Supply function (afloat), is one of a series of reports being prepared to present tentative criteria for determining the quantitative/qualitative requirements, on a functional basis, of criteria ratings afloat.

Ratings Analysis Report on the GM Rating. PRASD Report No. 233. May 1964. Joseph R. Heinzel.

Research in this report deals with problems and personnel systems associated with the Gunner's Mate (GM) rating other than those related to advancement qualifications. Two major findings are presented: (a) that no changes are required at this time in the GM rating structure, scope, advancement qualifications, or training course content; and (b) that the feasibility of establishing a broad program for training GMG's now in the fleet in the electrical/electronics area should be investigated.

Enlisted Personnel Systems in Oceanography. PRAW Report No. 64-35. June 1964.

This report presents the results of research into current and projected enlisted personnel requirements at Navy activities that conduct work in oceanography, particularly survey ships. Included in this report is detailed information and analyses concerning diverse types of oceanographic activities and programs; oceanographic ships operation, under construction, and planned; qualitative and quantitative enlisted manpower requirements and utilization aboard survey ships; and trends in technological developments in oceanography and their implications to future personnel requirements.

Practical Factor Analysis of the Electronics Technicians Rating by EDP Techniques. PRAW Report No. 64-37. June 1964.

This report presents a summary of results of a survey of performance of practical factors for advancement in rating by 1082 Electronics Technicians located aboard 63 ships and at 34 shore activities.

Research Report on Revision of the Scope and Qualifications of the Missile Technician Rating. PRASD Report No. 237. June 1964. Joseph R. Heinzel and LT Earl I. Oliver, USN.

This report describes a study of the MT rating to determine the changes in the scope and advancement qualifications necessary as a result of the deletion of surface-to-air missiles from the MT rating. The proposed revised MT scope and qualifications, and a detailed explanation of the revisions are presented.

Research Report on Tentative Staffing Criteria for Naval Communications Ashore (European-African Installations). PRAW RS 64-11. June 1964.

This research report covers a wide range of naval communications by concentrating on the operation portion of general service (overseas/ashore) activities, under the sponsorship of the Director. Naval Communications, and correlating the results thereof with data from previous studies.

SSB(N) Weapons System Personnel Statistics. Report No. ND 64-71. PRAW. Research Memorandum. June 1964. 25 pp.

This is a statistical comparison of the enlisted personnel input to the FBM Program during the period 1 January 1964 to April 1964 against the personnel input for previous study.

A Study of Requirements for 11XX and 13XX Officers. PRAW RS 64-41. June 1964.

This report includes proposed criteria for the identification of Unrestricted Line Officer billets for the grade of captain and identifies billets which would be filled by officers qualified in one of the unrestricted line professional areas. These billets are broken down into three categories, i.e., 11XX billets, 13XX billets, and those which can be filled by only unrestricted line captain.

Tentative Staffing Criteria for Combat Information Center (CVS). PRAW RS 64-12. June 1964.

This report contains detailed staffing criteria for the Combat Information Center aboard CVS-type carriers and includes methodology used and recommendations for future development of criteria for this functional area.

Tentative Staffing Criteria for Combat Information Center on DD-710 and DD-692 Class Destroyers. PRL Report No. RS 64-44. Wash., D. C. June 1964. 106 pp. H. M. West.

The approach and methodology used in developing staffing criteria for the DD-710 and DD-692 Class ships are discussed. Staffing tables are presented to cover a variety of degrees of operational readiness.

Tentative Staffing Criteria for CVS Aircraft Handling/Services. PRAW Report No. 64-6. June 1964.

This research report presents the results of detailed study of qualitative and quantitative requirements of the Aircraft Handling and Servicing function for CVS type carriers.

Tentative Staffing Criteria for Electronics Maintenance (AFLOAT). PRAW RS 64-19. June 1964.

This research report presents tentative staffing criteria for the Electronics Maintenance (Afloat) function, the methodology used to arrive at these determinations and EDP application to these criteria.

Tentative Staffing Criteria for Engineering Department Ratings on Aircraft Carriers (CVS-10). PRAW RS 64-8. June 1964.

This report, covering 13 subfunctions of the Engineering function (afloat), is one of a series of reports prepared to present tentative criteria for determining the quantitative/qualitative requirements, on a functional basis, of critical ratings afloat. It supplements and updates Report No. 63-17, June 1963. Excludes complement requirements for 13 functions covered.

Tentative Staffing Criteria for Executive Staff Ratings on Aircraft Carriers (CVS). PRAW Report No. 64-13. June 1964.

This report, covering the seven functions comprising a Ship's Executive Staff (Command, Legal, Chaplain, Military Personnel, Special Services, Public Information, and Postal Services), is one of a series of reports being prepared to present tentative criteria for determining the quantitative/qualitative requirements on a functional basis, of critical ratings afloat.

Tentative Staffing Criteria for Medical and Dental Department Ratings on Aircraft Carriers (CVS). PRAW RS 64-29. June 1964.

This report, covering the Medical and Dental functions (afloat), is one of a series of reports being prepared to present tentative criteria for determining the quantitative/qualitative requirements, on a functional basis, of critical ratings afloat.

Tentative Staffing Criteria for the Navigation Function. PRAW Report No. 64-14. June 1964.

This report, covering the Navigation function, is one of a series of reports being prepared to present tentative criteria for determining the quantitative/qualitative requirements, on a functional basis, of critical ratings afloat. This criteria covers ships of several types and classes.

Staffing Criteria for the Medical Function, CVS Type Aircraft Carriers. PRL Report No. RS 64-20. Wash., D. C. July 1964. 56 pp.
A. J. Barnett.

Staffing criteria have been developed for determining, on a functional basis, the qualitative/quantitative staffing requirements for the Medical function aboard CVS aircraft carriers.

Criteria for Identification of Officer Postgraduate Billets. PRL Report No. RS 64-52. Wash., D. C. August 1964. 16 pp.
H. M. Worth, M. E. Johnson, & J. M. Pugh.

Establishes definitive criteria for identification of naval officer billets in which postgraduate education can be used to advantage.

Identification of Unrestricted Line Officer Billets (Commander). PRL Report No. RS 64-53. Wash., D. C. August 1964. 108 pp.
Harriet A. Parrack.

Unrestricted line commander billets are analyzed to identify and tabulate those billets requiring a specifically qualified (aviation, non-aviation, and submarine qualified) unrestricted line commander and billets that can be filled by any unrestricted line commander.

Proposed Naval Reserve Officer Professional Development System (With Professional Development Pattern for Naval Warfare Surface Area). PRL Report No. RS 64-42. Wash., D. C. September 1964. 47 pp.
J. H. Swann, C. A. Hart, and J. M. Pugh:

This report proposes a format for a professional development system for Naval Reserve officers, and includes a pattern for the professional development of officers in the surface naval warfare area. This pattern will also serve as the model for the other patterns to be developed.

SSB(N) Weapons System Personnel Statistics (1 April 1964 to 1 August 1964). Report No. ND 65-8(N). Personnel Research Note. September 1964. 6 pp.

This report presents a quantitative and qualitative study of enlisted technical personnel ordered into FBM Weapons System training during the period from 1 April 1964 to 1 August 1964.

A Survey Report on the AG Rating. PRASD Report No. 241. September 1964.
Oscar B. Holt.

At the direction of the Chief of Naval Personnel, this Activity conducted a research survey on the Aerographer's Mate (AG) rating to determine if any current problems associated with the rating could be reduced or solved by changes in the scope, structure, advancement qualifications, or NEC's of the rating.

It was found that the AG rating is meeting operational and administrative requirements and that, therefore, no changes are required in the enlisted classification system as it pertains to the AG rating.

A Survey Report on the SM Rating. PRASD Report No. 242. October 1964. Harold W. Croulet.

At the direction of the Chief of Naval Personnel, this Activity conducted a research survey on the Signalman (SM) rating to determine if any current problems associated with the rating could be reduced or solved by changes in the scope, structure, advancement qualifications, or NEC's of the rating.

It was found that the SM rating is adequately meeting operational and administrative requirements and that, therefore, no changes are required in the enlisted classification system at the present time.

Promotion Percentage Rates by PNEC and Programs Compared with Navy Wide Percentage Rates by Rating. Report No. ND 65-17(N). Personnel Research Note. November 1964. 7 pp.

The purpose of this report is to determine if there is any significant difference between overall Navy rating promotion rates and promotion rates of specially training personnel identified by Primary Navy Enlisted Codes.

A Survey Report on the QM Rating. PRASD Report No. 244. November 1964. Harold W. Croulet.

At the direction of the Chief of Naval Personnel, this Activity conducted a research survey of the Quartermaster (QM) rating to determine if any current problems associated with the rating could be reduced or solved by changes in the scope, structure, advancement qualifications, or NEC's of the rating.

It was found that the QM rating is adequately meeting operational and administrative requirements and that, therefore, no changes are required in the enlisted classification system at the present time.

MANPOWER MANAGEMENT (CONT'D)

Tentative Staffing Criteria for Weapons and Deck Functions on DD-710 Class Destroyers. PRL Report No. RS 64-49. Wash., D. C. November 1964. 82 pp. W. J. Cook.

The development of staffing criteria for Weapons and Deck functions performed aboard DD-710 Class ships is discussed. Staffing tables for pertinent functions and subfunctions are presented.

Proposed Revised FT Advancement Qualifications. PRASD Report No. 251. December 1964. Joseph R. Heinzel.

At the direction of the Chief of Naval Personnel, this Activity conducted a research analysis of the advancement requirements for the Fire Control Technicians (FT) rating to determine what changes were needed as a result of the phasing out of the Missile Technician (MT) rating from the surface-to-air missile program.

The proposed revised FT advancement qualifications resulting from this research are presented in this report.

Rating Analysis Study on the Machine Accountant. PRL Report No. RS 64-57. Wash., D. C. December 1964. 54 pp. F. L. McTavish.

An analysis of the Machine Accountant (MA) general rating is presented. Recommends establishment of a course in EDP area and the establishment of an NEC to identify UNIVAC 1004 trained personnel.

Research Report on Non-Rated Bases for Navy Ratings. PRASD Report No. 252. December 1964. Richard D. Conner.

At the request of the Chief of Naval Personnel (Pers-15) this Activity is conducting research on enlisted planning ratios. The need for this research was recognized by the Plans Division (Pers-A12), Bureau of Naval Personnel, which is responsible for personnel planning in the area of enlisted strength, enlisted advancements, and training input to enlisted ratings.

This report contains results of the phase of this research which is concerned with developing recommended non-rated bases for Navy ratings. It is designed as a working document for use by the Plans Division. Data contained in this report will assist enlisted planners in selecting non-rated requirements to be used in enlisted strength planning.

Research Report on Revisions of the DS Advancement Qualifications. PRASD Report No. 249. December 1964. Oscar B. Holt.

Under the direction of the Chief of Naval Personnel, this Activity is conducting a two-phase research study of the Data Systems Technician (DS) rating. The first phase has been completed and the results are presented in this report.

The purpose of this phase was to determine what revisions are required in the DS advancement qualifications to bring them more into line with Navy requirements under the current scope and definition of the DS rating. The proposed revised qualifications resulting from this research are contained in the report.

The second phase of this research is concerned with the question of whether or not the scope and definition of the DS rating be revised and broadened to encompass new hardware systems which employ electronic digital data equipment.

SSB(N) Weapon System Personnel Statistics. PRL Report No. ND 65-22(N). Wash., D. C. December 1964. 6pp. W. T. George and L. M. White.

An analysis of selected factors which characterize the quality of personnel ordered into FBM Weapon System training for the period 1 August 1964 to 1 December 1964.

Analysis of Pers-C1 Comments on Tentative Revised FT Qualifications. PRASD Memorandum Report No. 65-1. January 1965. Joseph R. Heinzel.

This special report was prepared in response to a request from the Chief of Naval Personnel to analyze and comment on certain questions and comments concerning the training and qualifications of Fire Control Technicians (FT) and was intended for internal use in the Bureau of Naval Personnel.

Rating Structure Analysis of the TM Rating. PRASD Report No. 254. January 1965. Gordon M. Campbell and Joseph R. Heinzel.

At the request of the Chief of Naval Personnel, this Activity conducted a comprehensive analysis of the Torpedoman's Mate (TM) rating to determine if the structure or scope of responsibility of the rating required revision to better serve the needs of the Navy.

The results of this analysis indicated that there are no operational or administrative problems which could be significantly reduced by changes in the structure or scope of the TM rating.

It was found that the most serious problem associated with the TM rating was a shortage of qualified TM's aboard tenders. Although this problem is being reduced by changes in personnel assignment policies, it was concluded that the problem deserves continued attention to determine if further changes in assignment policies are required.

An Analysis of the AM Rating Structure. PRASD Report No. 263. February 1965. R. D. Conner, LT L. H. Smyth, USN, and R. V. May, Jr.

At the request of the Chief of Naval Personnel, a comprehensive analysis of the Aviation Structural Mechanic (AM) rating was conducted to determine whether or not its service rating structure should be revised to bring it more in line with current and anticipated fleet requirements.

The primary recommendations resulting from this research are that the AMH and AMS service ratings should not be combined at this time and that the AME service rating should be separated from the AM rating and established as a new general rating.

Comments on the Feasibility of an Aviation Support Equipment Rating. PRASD Memorandum Report No. 65-4. February 1965. R. D. Conner, LT L. H. Smyth, USN, and R. V. May, Jr.

This report was prepared for use by the Permanent Board for Review of the Enlisted Rating Structure of the Bureau of Naval Personnel in its hearings on the proposal to establish a new enlisted rating for Aviation Support Equipment. The report deals primarily with the question of the degree to which the ratings in the construction group (Group VIII) could perform the required ASE maintenance.

Research Report on the FT Rating Structure. PRASD Report No. 262. February 1965. J. R. Heinzel and R. V. May, Jr.

At the direction of the Chief of Naval Personnel, this Activity conducted a research survey on the Fire Control Technician (FT) rating to determine if any current problems associated with the rating could be reduced or solved by changes in the scope, structure, advancement qualifications, or NEC's of the rating.

It was found that revisions in both the scope and the structure of the rating would increase the overall effectiveness of the rating.

Survey on Air Intercept Controller Requirements for the Radarman Rating. PRASD Memorandum Report No. 65-5. February 1965. Oscar B. Holt.

This report was prepared for internal use by CNO and BUPERS relative to the question of whether or not the scope and qualifications of the Radarman (RD) rating should be changed with respect to Air Intercept Controller responsibilities. The recommendation was that minor changes should be made.

A Survey on the Scope and Advancement Qualifications for the Airman Rate. PRASD Memorandum Report No. 65-3. February 1965.

At the request of the Chief of Naval Personnel, this Activity conducted a research survey on the Airman (AN) scope and advancement qualifications to determine whether or not revisions were necessary to update them or to bring them into line with current fleet requirements. The results of this survey indicated that only minor revisions were necessary in the scope and qualifications of the AN rate.

Tentative Staffing Guide, DD-710 Class. PRL Report No. RS 65-5. Wash., D. C. February 1965. 77 pp. A. W. Bright, et al.

The research approach, rationale, and methodology used in developing staffing criteria for the DD-710 Class ships are discussed. The criteria are applied to develop a recommended peacetime allowance for ships of this class.

Navy Enlisted Classifications for Polaris FBM Weapon System. PRL Report No. WRM 65-1. Wash., D. C. March 1965. 45 pp.
A. J. Rose.

Analyzes Polaris weapons and navigation systems NECs. Recommends that five Polaris NECs be consolidated into two in order to eliminate unnecessary overlapping of skills.

SSB(N) Weapons System Personnel Statistics. PRL Report No. ND 65-34(N). Wash., D. C. March 1965. 5 pp. L. M. White.

An analysis of selected factors which characterize the quality of personnel ordered into FBM Weapons System training for the period 1 December 1964 to 1 March 1965.

Staffing Guide, Guided Missile Cruiser, CG-10 Class. PRL Report No. RS 65-2. Wash., D. C. March 1965. 264 pp. A. W. Bright, et al.

The methods, approach, and rationale employed in the development of staffing criteria for a CG-10 Class cruiser are discussed. The criteria are applied to develop a recommended peacetime allowance for ships of this class.

Analysis of NEC's for the DS Rating. SRM 65-1. April 1965. Oscar B. Holt and R. V. May, Jr.

This was an interim report designed to give advance information to the Chief of Naval Personnel on the need for revisions in the NEC's of the Data Systems Technician (DS) rating. Minor changes were recommended.

Recommended Qualifications Standards for Aviation Warrant Officer Categories. SRM 65-2. April 1965. Oscar B. Holt.

As a result of revisions in the structure and scope of the warrant officer categories emanating from the Settle Board, new and updated qualifications standards for all categories were required. This Activity was directed to develop the standards for the aviation categories. This report presents the proposed standards.

Analysis of Practical Factors Performance by Sonar Technicians(STs). PRL Report No. WTB 65-1. Wash., D. C. May 1965. 139 pp. R. W. Gettings.

Extends an earlier investigation on the feasibility of applying statistical procedures in the review of enlisted qualifications for advancement in rating. Presents results of a survey of 151 activities and establishes feasibility of survey technique.

Memorandum Report on Converting Army Garrison Staffing Guide for Navy Use. PRL Report No. RS 65-6. Wash., D. C. May 1965. 182 pp. W. F. Hopper.

A special project to convey Army staffing guides into a format suitable for use by the Navy is described. Forty-one staffing tables for Public Works and Ordnance functions are presented. Report concludes that converted tables have limited application and recommends further validation of staffing tables prior to promulgation in the U. S. Navy Staffing Criteria Manual for Activities Ashore.

Method Development for Basic Technical Skills Research - A Progress Report. SRR 65-4. May 1965. Joe Silverman and Malcolm J. Carr.

At the request of the Chief of Naval Personnel, this Activity is conducting research to develop a method for determining basic technical skills for current and future weapons and support systems so as to provide the basis for the Navy enlisted personnel classification structure required for the next decade. The engineering department in destroyers was selected for the pilot study in this research. When the method is developed, it will be applied to other occupational areas and ship types.

The method being developed in this research involves the analysis of tasks and patterns of tasks in terms of the Technical, Organizational, and Communicational dimensions of the work situation. The acronym SAMOA (Systematic Approach to Multidimensional Occupational Analysis) has been adopted as a label for this method.

The purpose of this report is to describe the progress achieved so far in this pilot study and the plans for subsequent phases of this research.

A Method for Developing Optimal Petty Officer Ratios. SRR 65-3. May 1965. R. D. Conner and R. V. May, Jr.

This report demonstrates the application of a computerized mathematical model designed by this Activity which can be used in determining optimal petty officer ratios, taking into consideration current trends in retention rates, advancements in rating, and future petty officer requirements.

The model was applied experimentally to the Radarman (RD) rating to determine to what extent current RD petty officer shortages could be overcome under a 60:40 ratio of rated to non-rated personnel and under a 55:45 ratio.

Analysis of the Damage Controlman Rating. PRL Report No. WRM 65-12. Wash., D. C. June 1965. F. McTavish.

An analysis was made of the problems and personnel systems associated with the Damage Controlman (DC) rating.

Results of this study indicate: (1) No changes are required at this time in the DC rating structure, scope, or Navy Enlisted Classifications (NECs); (2) some changes are necessary to the advancement qualifications; and (3) based on research to-date a program should be established to improve current training to ensure adequately trained DC personnel for the Fleet.

Analysis of the Mineman Rating. SRM 65-10. June 1965. Joseph R. Heinzel.

The purpose of this report is to present the results of a research survey on the question of whether the Mineman (MN) rating should be retained in its present form, disestablished, combined with another rating, or otherwise changed in structure. The findings of this research indicate that the Mineman (MN) rating should be retained in its present form.

Feasibility Research Study on EDP Applications to Performance and Knowledge Requirements for Interior Communications Electricians (IC). PRL Report No. WTB 65-2. Wash., D. C. June 1965. R. Architzel and B. T. Litton.

Presents information on the feasibility of applying statistical procedures in the review of enlisted qualifications for advancement in rating. Results of a survey of 128 ships are presented and feasibility of survey technique established.

Identification of Unrestricted Line Officer Billets - Summary Report. PRL Report No. WRM 65-8. Wash., D. C. June 1965. 14 pp. Harriet A. Parrack.

The results of research to develop criteria for determining billets that require specifically qualified unrestricted line officers are summarized.

Officer Classification Coding System Improvement (A-Code Elimination). PRL Report No. WRM 65-5. Wash., D. C. June 1965. 21 pp. Emma R. Hubbs.

Methodology for evaluating the officer classification coding system is developed. Included in this report is a proposal for the elimination of the Civilian Qualification Codes (A-Codes).

Qualifications and Professional Guidance for Naval Reserve Officers (1105) Naval Warfare/Operations, Surface. PRL Report No. WRM 65-11. Wash., D. C. June 1965. J. Swann, C. A. Hart, and J. M. Pugh.

Qualifications requirements for Naval Reserve officers (1105) specializing in the Naval Warfare/Operations, Surface area were developed and reported in this research. An assessment of training required to ensure acquisition of these qualifications was made and a training plan was developed relating available training to qualifications requirements for each officer grade. Also, procedures for evaluating an officer's current qualifications were developed, including the construction of forms for use in evaluating an officer's qualifications.

Survey Report on Shipfitter Rating. PRL Report No. WRM 65-9. Wash., D. C. June 1965. 21 pp. H. C. Rosicky and F. L. McTavish.

Outlines current status of Shipfitter rating. Recommends further study, particularly in the areas of training, qualifications and NECs.

Updating and Reproducing Staffing Tables by Automatic Data Processing System Methods. PRL Staff Paper. Unnumbered. Wash., D. C. June 1965. A. J. Barnett.

This paper summarizes the results of an investigation conducted to determine the feasibility of updating and reproducing staffing tables by automatic data processing (ADP) methods. Conclusions reported are results of analysis of the format, uses, and methods of revising Staffing Criteria Manuals for Activities Afloat and Ashore, and consideration of the probable effects of applying ADP methods to update and reproduce segments of the manuals.

U. S. Navy Staffing Criteria Program: Briefing Outline. PRL Staff Paper. Unnumbered. Wash., D. c. July 1965. A. W. Bright.

This paper outlines steps involved in the development of staffing criteria for Navy activities ashore and afloat. Information is in the form of a briefing used at activities whose work functions are to be studied in connection with criteria development.

Pertinent background information pertaining to the staffing criteria program is also included in this briefing. In addition, accomplishments to date, research projects in progress, and sample data collection questionnaires are presented.

Sonar Technician Rating Structure. PRL Report No. WRM 66-2. Wash., D. C. July 1965. 16 pp. H. C. Rosicky.

The rating structure of the Sonar Technician (ST) rating was analyzed to uncover any problems. A basic part of the study concerns the differences between submarine and surface STs. Analysis of these differences indicates the reasons why submarine and surface STs are not, and should not be, used interchangeably as a normal practice. Consideration is given to the fact that similar rating structure problems exist for other ratings used for both submarines and surface ships. Also, there is a policy to compress ratings at the E-8 and E-9 levels wherever feasible. In view of the above, the following recommendations are made: (1) Extend the STS and the STG service ratings through the CPO (E-7) level, and (2) conduct a study in depth to determine the desirability of separating other ratings with electronics backgrounds, e.g., Fire Control Technician rating, between submarines and surface ships. Simultaneously, assess the desirability of compressing the resultant ratings at the E-8 and E-9 levels within their respective areas of operations.

A Method for Structuring Technical Tasks. STB 66-4. August 1965. (With Technical Supplement, STB 66-4A). Joe Silverman.

Research is being conducted to develop a method for determining technical skills required for current and future weapons and support systems which can serve as a basis for the Navy enlisted classification structure required in the next decade. This report describes a statistical classification technique which has been devised to stratify work tasks by their level of complexity.

Complexity is a task attribute measured in terms of a set of hierarchical criteria distinguishing levels of "functional" complexity, together with ratings of "equipment" complexity. The results produced by this technique were validated by a paired comparison study which yielded high rank differences correlations (nine validation groups averaged $r_s = .84$ between the rank order of tasks by technically qualified judges and the rank order as determined by the task indices developed during this study

It is intended that this method for evaluating the complexity of technical tasks will be used to distinguish among the different technical skill levels inherent in groups or clusters of tasks and billets. Copies of the questionnaires, task lists, and other forms associated with the task classification method are contained in a Technical Supplement (STB 66-4A).

Applications of a Computerized Model in Enlisted Personnel Planning.
SRR 66-3. September 1965. Richard D. Conner, and R. V. May, Jr.

This report describes a computerized algebraic model designed to perform some of the critical functions in the area of enlisted personnel planning in the Navy. The major personnel variables dealt with are attrition, advancements, on board count, vacancies, and test taker and passer rates. The model simulates the enlisted advancement system and makes predictions of the values of these variables for all nine pay grades of all enlisted ratings (occupations) for five years into the future. The model is also designed for use as a management tool to predict the results of policy and planning decisions before they are made. When operational in the Bureau of Naval Personnel, this model will enable personnel planners to perform their planning functions with a degree of speed and accuracy not possible with present methods.

Professional Development System for Naval Reserve Officers not on Active Duty: Procedures for Reporting Completion of Naval Reserve Qualifications and Training. PRL Report No. WRM 66-8. Wash., D. C. September 1965. 25 pp. C. A. Hart, E. M. Hubbs, and J. M. Pugh.

The purpose of this project was to develop instruments and procedures for reporting completion of qualifications attained by Naval Reserve Officers not on active duty through participation in a Naval Reserve program. This study was based on the fact that existing forms and procedures were not designed to provide the required information to commands responsible for administration of the Naval Reserve program; and that existing procedures could be altered to provide required information to cognizant commands.

Staffing Guide, Oiler AO-22 Class. PRL Report No. WRR 66-5. Wash., D. C. September 1965. 33 pp. W. J. Cook.

Staffing criteria for all functions on AO-22 Class ships were developed. The findings are applicable to AO-22 Class and AO-22 Class with JUMBO conversion (AOJ). The basic research was conducted aboard the USS MARIAS (AO-57), USS CHIKASKIA (AO-54), and the USS NAVASOTA (AO-106) during at sea and in port periods. Included in the ship manning requirements are the design of systems and procedures necessary for the continued development, maintenance, dissemination and application of staffing criteria. Summary comparisons are made of the staffing criteria allowance vs. the present manpower authorizations.

Techniques for Conducting Rating Qualifications Surveys. PRL Report No. WRM 66-6. Wash., D. C. September 1965. R. W. Gettings.

Research was directed toward the development of improved management tools for reducing the cost of reviewing the Manual of Qualifications for Advancement in Rating, NAVPERS 18068, while increasing the validity of the end product. Guidelines are presented for conducting rating qualification surveys. These guidelines provide a degree of standardization in surveys and survey techniques which permit development of criteria for the evaluation of survey results and allow cross comparison of results between ratings.

ADP Application to Staffing Criteria for Electronics Maintenance Function Afloat. PRL Report No. WRM 66-9. Wash., D. C. October 1965. A. J. Barnett.

Research was conducted to locate, process, and use information necessary to the development of staffing criteria for the Electronics Maintenance function afloat by automatic data processing system techniques. A list of quantitative/qualitative manpower requirements to maintain approximately 1550 items of electronics equipment is appended to this report.

In the next phase of this research ET requirements for selected ships will be calculated on the RCA 301 computer. This will be accomplished by matching the appropriate Ship Electronics Installation Records (NAVSHIPS 4110) with the manpower requirements shown on the master list.

Criteria for Combining Navy Enlisted Classifications, (NECs). PRL Report No. WRM 66-13. Wash., D. C. October 1965. A. J. Rose.

To assist BuPers manpower managers of the Polaris FBM Weapons System, criteria have been developed for consolidating and combining NECs whose skills are essentially similar. These criteria will solve the problem of overlapping skills and the resulting multiple differentiation by NECs of jobs that would best be described by one NEC. The advantage of a simplified classification system is that it would require personnel to undergo training extensive enough to make them more flexible for assignment purposes, thereby facilitating the process of distribution and detailing.

Project COMPASS: A Computer Assisted Classification System for Navy Enlisted Men. SRR 66-6. October 1965. Leonard C. Swanson, and Andrew N. Dow.

This report describes Project COMPASS, a computer-assisted classification system for assigning Navy recruits to schools and to general detail job codes. While the procedure has been developed for use at NTC/SDIEGO, it is readily adaptable for use at other recruit training centers. Assignments of recruits to schools are made first, followed by assignments to general detail job codes. School quotas are filled by an overall best combination of men--the computer being programmed to maximize the sum of selection test scores for the individual schools. All requirements concerning test scores, recruiting program, physical and volunteer requirements are incorporated into the COMPASS system. The classification interviewer's recommendations are differentially weighted to reflect recruit motivation and the needs of the service. Computer based assignment of non school-qualified recruits to on-the-job training codes are also obtained.

Comparisons between "hand" and COMPASS assignments indicate that improvements using COMPASS assignments over the conventional hand assignment method are achieved by both raising the average of school selector test scores and by filling quotas with qualified men where there is a short supply of school-eligible recruits. The implementation of Project COMPASS will facilitate subsequent use of other advanced methods of personnel selection which are not feasible without the use of a computer. The immediate implementation of Project COMPASS at NTC/SDIEGO and steps leading to its extension to NTC/GLAKES were recommended.

Staffing Criteria for Commissary Stores. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. October 1965. G. Robinson.

Staffing Criteria for Electric Accounting Machines. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. October 1965. D. Wedding, W. Bell, and A. Barnett.

Staffing Criteria for Station Hospitals. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. October 1965. D. Wedding, A. J. Barnett, and A. G. Anderson.

Supply Functions for Industrial Type U. S. Naval Air Stations, and Master Jet Air Stations. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. October 1965. W. T. Lyons.

Staffing Criteria, AO-143 Class Ships. U. S. Navy Staffing Criteria Manual for Activities Afloat. OPNAVINST 5310.6A. PRL Wash., D. C. November 1965. D. Wedding, W. Cook, and T. Gentel.

Determining the Desirability of Combining the Machinist's Mate (MM), Boilerman (BT), and Engineman (EN) Rating Into a Single Main Propulsion Technician Rating. PRL Staff Study. Unnumbered. Wash., D. C. December 1965. M. W. Lockett.

An evaluation was made concerning the desirability of combining the Boilerman (BT), Machinist's Mate (MM), and Engineman (EN) ratings. It was found that the qualifications for each of the ratings required distinct and separate knowledge of specific work areas, and that these work areas require skills unique to each rating. It is recommended that the Navy retain MM, BT, and EN as separate ratings.

Progress Report on Design of New Concepts and Techniques for a Total Officer Personnel System (TOPS). PRL Progress Report. Unnumbered. Wash., D. C. December 1965. W. L. Himes.

Initial research is under way to develop a comprehensive officer personnel system capable of meeting the Navy's requirements of the next decade and designed to make advantageous use of the capabilities of modern data processing equipment.

Preliminary analysis of the problem and recommendations for future research are presented.

Proposed Revised Qualifications Standards for Aviation Limited Duty Officers. SRM 66-13. December 1965. Oscar B. Holt.

This report presents the final proposed revised qualifications standards for the eight categories of Aviation Limited Duty Officers. These qualifications were developed in accordance with the revised LDO categories resulting from the recommendations of the Settle Board. These qualifications will be published in a change to the Manual of Navy Officer Classifications (NAVPERS 15839A).

Staffing Criteria for AR Type Ships. U. S. Navy Staffing Criteria Manual for Activities Afloat. OPNAVINST 5310.6A. PRL Wash., D. C. December 1965. T. Gentel, A. Anderson, R. Architzel, PNC H. Gardner, D. Wedding, and K. Witham.

Staffing Criteria, Aviation Safety Function. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. December 1965. W. F. Hopper.

Staffing Criteria for Disbursing Function: Navy Finance Centers, Navy Regional Offices, and Navy Finance Centers. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. December 1965. (NAVCOMPT). W. T. Lyons.

Staffing Guide for Oilers of the AO-22 and AO-143 Classes. PRL Report No. WRM 66-23. Wash., D. C. December 1965. A. G. Anderson.

Ship manning requirements for all functions on oilers were developed. In connection with this major objective the report: (1) provides a guide to personnel planners in determining manpower, training, and budget requirements, and the effects of mission or equipment changes on the personnel requirements for oilers of this Class; (2) presents summarized staffing criteria tables for the AO-22 and AO-143 Class ships based on the proposed standards; and (3) compares the recommended staffing with present allowances as set forth in NAVPERS 576 documents.

Job Evaluation: A Preliminary Analysis of its Application to Navy Enlisted Billets. PRL Report No. WRM 66-27. Wash., D. C. January 1966. 67 pp. A. J. Rose and F. L. McTavish.

Job evaluation of enlisted billets in the Navy is a complex problem. Advancements in technology, as well as in strategic and tactical planning have given rise to problems of such magnitude in personnel administration as to require management tools capable of coping with the vast number and diversity of skills employed in today's Navy.

It is concluded on the basis of the research conducted that: (1) the practice of employing expert pooled judgment to determine why grade requirements no longer suffices as an effective management tool; (2) the Marine Corps billet evaluation system is not directly adaptable to Navy billets; (3) collateral duties must be excluded from the evaluation of billets; and (4) that NEC described billets will have to be evaluated and assigned pay grades.

New Approaches to Mess Cook Management Afloat. PRL Report No. WRM 66-28. Wash., D. C. January 1966. 48 pp. T. B. Turner.

An exploration was made of new ways to manage mess cooking afloat, and specifically, the management system presently in use aboard the USS ALBANY (CG-10).

Aboard many ships, Class A, technically trained, personnel are diverted to mess cooking when non-designated SN or FN are unavailable. The ALBANY plan and similar plans, permit such personnel to work in their rating or continue OJT by establishing a mess-man division of non-designated strikers. Benefits of such a plan are increased morale of technical personnel, more efficient food service management, and increased apprenticeship opportunity for personnel interested in a supply career.

Sonar Technician Rating: General Analysis of Problem Areas. PRL Report No. WRM 66-26. Wash., D. C. January 1966. 46 pp. H. C. Rosicky.

The purpose of this study was to determine and analyze problems affecting the utility of the Sonar Technician (ST) rating as an element in a management and classification system. One of the most serious problems connected with the rating was found to be the low first term reenlistment rates among surface STs. Analysis of this problem revealed that the high turnover rate of surface STs is adversely affecting personnel effectiveness, formal and on-the-job training costs, and morale. It has been indicated that there are several causes for retention problems. Two most significant causes were identified as low pay and insufficient shore duty.

The 6-Year Obligator Program, designed to reduce personnel turnover and cost, was analyzed and found to be an improvement over the previous approach to training. Improved personnel selection during recruit training was recommended as one means of minimizing adverse effects of low personnel reenlistment in that it would reduce school attrition rates, and enhance personnel motivation, effectiveness and retention.

Staffing Criteria for Naval Supply Centers. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. January 1966. (BUSANDA). W. T. Lyons.

Proposed U. S. Navy Catalog of Functional Work Areas. PRL. Wash., D. C. February 1966. K. Witham, and N. Bedessem.

The Navy Catalog of Functional Work Areas has been developed to provide, through standardized titles and definitions, a classification of work performed by the military and civilian manpower of the Navy and thereby provide a tool for uniform manpower reporting. For example, the Catalog will be a standard reference used by appropriate naval activities when reporting total manpower on the Manpower Listing (NAVEXOS 4521).

A Network Flow Technique for Optimizing Personnel on Board by Pay Grade. SRR 66-12. February 1966. Donald F. Hayter and Richard D. Conner.

This report describes one of a series of computerized techniques developed by this Activity in a continuing research program to provide the Bureau of Naval Personnel with new and improved methods for carrying out its enlisted personnel planning functions.

The technique is based upon a network flow model uniquely designed for allocating present and future enlisted manpower resources within the limits of constraining factors in a manner that will meet manpower requirements as closely as possible. In short, it is a planning technique for optimally allocating personnel on board at all pay grades of a rating for the next five years.

The model considers the present number of personnel on board at each pay grade of a rating and will attrite and advance them realistically in future time periods. The future allocation of personnel among pay grades is optimized for a five-year period relative to the pay grade requirements within the constraints of predicted personnel attrition, advancements, reductions in grade (demotions), and the non-petty officer base.

Qualifications Standards for the Aviation Support Equipment Technician (AS) Rating. SRM 66-18. February 1966. R. V. May, Jr., and J. R. Heinzel.

This report summarizes the procedures followed in developing the advancement in rating qualifications for the recently established rating of Aviation Support Equipment Technician (AS). A copy of the final proposed qualifications standards is presented in the appendix of the report.

Analysis of the Feasibility of an Aircrewman Rating. SRM 66-20. April 1966. R. V. May, Jr., and J. R. Heinzel.

This report evaluates various occupational rating structures in terms of their potential value in reducing the problems associated with air ASW operations. The conclusion reached is that a new rating, ASW Operator (AW), should be established. It should have three service ratings extending through pay grade E-6 and combining at the E-7 level as a general rating through E-9. Each service rating should encompass operator and in-flight duties and organizational level maintenance responsibilities on all ASW equipment within one aircraft type; namely, patrol (VP), fixed wing ASW (VS), and helicopter (HS).

A Computer Technique for Clustering Tasks. STB 66-23. April 1966. Joe Silverman.

This report describes a new method for grouping task patterns by means of an advanced computerized technique for clustering work tasks which was developed in the course of a broad research project concerned with devising a method for determining basic technical skills (SRR 66-23). With an input of tasks performed in a sample of jobs, this computerized technique produces a series of relatively homogeneous clusters of task patterns. These clusters represent the occupational specialties that exist in a field of work. This clustering technique complements a method (see STB 66-4) of determining the technical skill levels of those task clusters.

The most important features of this technique are: (1) its capacity for computer analysis of task patterns of large numbers of subjects, (2) its capacity for computer assistance in making research decisions at various levels of task analysis, and (3) its flexibility as a tool of pattern recognition and structuring.

This report is intended primarily for research and staff personnel concerned with task analysis. In addition, this report should be of interest to those concerned with other clustering, classifying, and taxonomic techniques. The same basic problem of clustering phenomena by some criterion of similarity is encountered by physicists, mathematicians, computer programmers, bio-medical engineers, information theorists, and others. With only minor modifications, the computer programs and concepts described in this report could be of value in these other fields.

Staffing Criteria for A, B, C Schools. U. S. Navy Staffing Criteria. Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. April 1966. A. L. O'Sullivan, W. R. Bell, and A. J. Barnett.

Staffing Criteria for Medical Function. U. S. Navy Staffing Criteria. Manual for Activities Afloat. OPNAVINST 5310.6A. PRL Wash., D. C. April 1966. A. J. Barnett.

Staffing Criteria for Training Devices. U. S. Navy Staffing Criteria. Manual for Activities Ashore. OPNAVINST 5310.5A. PRL Wash., D. C. April 1966. H. M. West, and G. Robinson.

A Computer Program for the Determination of an Optimal Advancement Policy for Petty Officers: A Dynamic Programming Approach. SRM 66-31. May 1966. William J. Moonan and Margaret H. Covher.

An important function of personnel planners in the Bureau of Naval Personnel is concerned with the establishment of policies for advancement of Petty Officers in various Navy ratings. This report describes the details of a digital computer program which will permit the determination of the optimum advancement policy for a rating for one time period, such as a year. The use of this program should materially assist these planners to perform their duties more effectively.

The background material, flowcharts, operating procedures and illustrative example are provided. The method of optimization used is known as dynamic programming. The report indicates that this work is being generalized for use over several time periods.

Guidelines for the Development of Navy Staffing Criteria. PRL Staff Paper. Unnumbered. Wash., D. C. May 1966. T. C. Gentel.

These Guidelines are designed to provide information to personnel involved in the development, maintenance, and application of staffing criteria promulgated in the United States Navy Staffing Criteria Manuals for Activities Ashore and Afloat.

Presented in these Guidelines are concepts, definitions, and terminologies, to provide a common basis of understanding, together with developmental methodologies and techniques applicable to Navy-oriented staffing criteria.

The Instrumentman Rating and the Calibration and Repair of Precision Instruments. PRL Report No. WRM 66-32. Wash., D. C. May 1966. 83 pp. (UNCLASSIFIED). T. B. Turner.

Investigations were conducted to apply quantitative procedures in the review of qualifications for advancement in rating, using rating qualification surveys and computer summerization of results. The Instrumentman (IM) rating was chosen as one of the ratings to be used as a test vehicle for development and refinement of the survey techniques.

In this survey of the IM rating, a sample of 36 ships and 31 shore activities were chosen. Major recommendations made as a result of this survey were (1) the IM rating be studied to determine the extent of the effect of the USS CASCADE (AD-16) mechanical instrument repair shop and similar planned shops on the scope of the rating, (2) the level of calibration of precision instruments by IM be investigated and appropriate use made of the interval of time (frequency) calibration standards under development by the Naval Observatory, and (3) the appropriateness of dividing the IM rating into three divisions (NECs or service ratings), watch and clock repair, office machine repair, and instrument repair.

Proposed Development of Navy Officer Qualification Classifications (NOQC's) for Interim Use by NRMC. PRL Report. Unnumbered. Wash., D. C. May 1966. E. Hubbs, H. Parrack, W. Himes, and J. Pugh.

This study was undertaken because of an immediate need by Pers-A15, Pers-D, and the Naval Reserve Manpower Center (NRMC) for a means of coding the primary occupational qualifications for professional development and mobilization assignment of inactive duty Naval Reserve officers. At present, there is no way of coding the professional development areas and primary qualifications for inactive duty officer mobilization assignment for input into tape records.

This report contains an explanation of this proposal and proposed Navy Officer Qualification Classifications (NOQCs) with their related Navy Officer Billet Classifications (NOBCs).

Calculation of Electronic Technician Manpower Requirements for the Electronics Maintenance Function Afloat. U. S. Navy Staffing Criteria. Manual for Activities Afloat. OPNAVINST 5310.6A. PRL Wash., D. C. June 1966. D. Wedding, H. M. West, W. R. Bell, and A. J. Barnett.

Computerized Enlisted Advancement Planning. SRR 66-21. June 1966. Richard D. Conner and R. V. May, Jr.

This report describes the development and application of a computerized advancement planning (ADPLAN) model designed by this Activity to assist the Navy in planning enlisted advancements. This model provides two types of printouts during the advancement planning process. First, before the results of the advancement examination are available, vacancies during the future advancement segment are predicted for each pay grade from E-4 through E-9. These results are used to detect problem areas, such as shortages or overages of manpower, and also to determine the number of advancements once the number of personnel passing the advancement examination has been determined. The second type of printout results when the number of personnel to be advanced to each pay grade of each rating is fed into the ADPLAN model. Vacancies remaining after advancements have been determined are recomputed by the model and then advancements to each pay grade are allocated to each of the six months of the advancement segment in proportion to the monthly attrition predicted to occur. The ADPLAN model also provides a summary of data for both types of printouts for all enlisted ratings combined. Plans for using the ADPLAN model as a simulation and prediction tool are discussed.

Desk Calculator Procedures for Determining Enlisted Personnel Planning Factors. SRR 66-19. June 1966. Richard D. Conner and T. B. Quisenberry, PNC, USN.

This report describes the method and procedural steps for applying the enlisted planning factors model to a segment of the enlisted rating structure using a desk calculator. Although this model has been computerized (SRR 66-3) it is sometimes convenient to perform calculations on one rating or pay grade without resorting to a computer. Variables, sources of data, and the appropriate symbols and formulas used in the model are described. Sample worksheets are presented to illustrate each step in deriving the results of the enlisted planning factors model by use of a desk calculator. An explanation of modifications for application to service ratings is also given.

New Concepts in Shipboard Manning: An Analysis of the Canadian Navy Approach. PRL Report No. WRM 66-48. Wash., D. C. June 1966. (UNCLASSIFIED). P. G. Haaga.

This report deals with the problem caused by the increase in manpower requirements aboard U. S. Navy combatant ships. It identifies support work functions aboard U. S. destroyers and recommends concepts aimed at improved manpower utilization. Objectives are to improve utilization of available men or to reduce the numbers and/or skill levels required for support work aboard destroyers of DD-710 class. A secondary aim is to determine the feasibility of removing selected support tasks from such ships to the shore or tender. Research is based on shipboard studies on U. S. destroyers, USS MASSEY (DD-778) and USS CORRY (DD-817), and a Canadian ship HMCS CHAUDIERE (DDE-235). Report also covers a study of Canadian support services in Maritime Command, Halifax, Nova Scotia for destroyers. Canadian experience with saving manpower aboard destroyers through ship and crew cycling, minimum manning for home port duty, and the Assisted Ship Replenishment Program is reviewed and analyzed. Manning comparisons are made between U. S. and Canadian destroyers. Certain Canadian concepts in the areas of personnel, supply, and reduced manning are recommended for test and consideration for U.S. Navy. Feasibility surveys and cost effectiveness studies are recommended on these concepts which promise improved manpower utilization aboard destroyers. The most extensive treatment in this report is given to the Assisted Ship Replenishment Program (ASRP), a computerized system for accounting for consumable stores in which the ship's storesmen are relieved of most of the routine clerical work in preparing requisitions and stock inventory reports. Further research is recommended on certain concepts for saving manpower aboard destroyers.

A Preliminary Study of the Paperwork of Technical Ratings Aboard Destroyers. SRR 66-25. June 1966. Norman I. Borgen and Joe Silverman.

This report presents a detailed description of the paperwork practices of shipboard enlisted personnel in technical ratings and analyzes the scope and variability of such paperwork. This preliminary study was generated by concern over the possibility that technically-trained personnel were spending a considerable portion of their time on paperwork not directly essential to the performance of the technical duties of the rating.

It was found that, of 12 technical ratings aboard eight destroyers, the time devoted to paperwork averaged 3.3 hours per week per man. Of this, a high percentage (75-80%) of time was devoted to paperwork which required the technical skills of the rating, and only 20% to 25% could be characterized as "general" paperwork. These findings suggest limitations in the possibility of producing savings by reducing non-technical paperwork.

Although great variability in paperwork practices among ships was characteristic, it was found that the higher pay grades have a disproportionately heavy workload and that E-4's showed a relatively small amount of paperwork. The techniques used in this research can be employed by individual ships to determine the extent of their paperwork workload and its allocation among ratings, pay grades, work groups, etc., and then institute their own corrective measures accordingly.

Prototype Summary of Enlisted Personnel Loss Data. SRM 66-44. June 1966. Richard D. Conner.

This report describes the Enlisted Change Data Bank which has been developed by this Activity. The data contained in this bank consist of between seven and eight million records on magnetic tape which describe certain characteristics of personnel whose change in status affected pay grade or rating strength since 1 July 1962. These changes are generally described as losses and gains to the Navy, lateral changes between ratings, and changes between pay grades within a rating, either up or down. The types of information contained in the record for each man are described so that interested personnel planners can become familiar with the data bank and make use of it.

A printout presenting the losses by all change codes for one rating is presented. A supplement to this report (SRM 66-44A) which contains the same data for all enlisted ratings, is also described. Proposed printout formats for other types of data extraction programs that could be written are also presented.

Qualifications and Related Training for Naval Reserve Officers (1105) Naval Warfare/Operations Surface. PRL Report No. WRM 66-52. Wash., D. C. June 1966. 96 pp. (UNCLASSIFIED). C. A. Hart.

Basic data are presented for the administration and training of Naval Reserve Officers (1105) with an afloat mobilization potential. Included in this study are those duties which naval warfare specialists (1105) not on active duty, should be capable of performing and those knowledges and skills which they should acquire in each grade and category, in order to carry out their mobilization assignments. Qualifications contained in this manual are divided into two types: (1) The General Qualifications which present requirements of a general nature applicable to all Naval Reserve officers, not on active duty, regardless of category, designator, or grade; (2) The Grade Qualifications which present specific requirements for professional duties and responsibilities, together with the knowledges and skills necessary for their performance.

<ins>Qualifications and Related Training for Naval Reserve Officers (1105) Naval Warfare/Operations, Surface: Anti-Submarine Warfare</ins>. PRL Report No. WRM 66-64. Wash., D. C. June 1966. 24 pp. (UNCLASSIFIED). C. A. Hart.

Qualifications and related training for 1105 officers with a mobilization potential for Anti-Submarine Warfare are outlined in this report. The study is part of a continuing effort for the professional development of Naval Reserve officers not on active duty.

<ins>SAMOA--A Method for Determining Work Requirements</ins>. SRR 66-23. June 1966. Malcolm J. Carr and Joe Silverman.

This is a progress report on research to develop a systematic, computerized approach for determining basic work requirements for current and future weapons and support systems. Work requirements are defined as task patterns and the characteristics of these tasks relative to technical, organizational, and communicational dimensions of the work situation. This approach has been termed "SAMOA" (<ins>S</ins>ystematic <ins>A</ins>pproach to Multidimensional <ins>O</ins>ccupational <ins>A</ins>nalysis).

The rationale upon which this research is based is that: (a) the enlisted personnel classification structure required for the next decade must be based upon valid and significant work requirements, (b) current methods for determining work requirements on a large scale are too slow, too subjective, and are limited primarily to the technical dimensions of work and, therefore, (c) the development of improved procedures for determining work requirements is a necessity.

The SAMOA method consists essentially of three major steps. First is the development and administration of comprehensive task lists and related data gathering forms. The second step is the computerized analysis of the data dealing with tasks and task patterns. This is accomplished by a computer clustering program which identifies homogeneous groups of men on the basis of similarity of patterns of tasks performed. The third major step is a set of computerized procedures for stratifying and grouping the resulting clusters on the basis of significant variables within three fundamental dimensions of the work situation; namely, Technical, Organizational, and Communicational. The indices of these TOC variables form the basis for the cluster profiles which would constitute the primary input into a personnel classification structure.

The next phase in this research is the application of the method to a larger sample of fleet units to test its reliability and to refine techniques and procedures. The SAMOA method should ultimately have applicability in the areas of manpower requirements determination, billet evaluation, job reengineering, occupational classification, and others.

Staffing Criteria Development for Training Devices. PRL Report No. WRR 66-7. Wash., D. C. June 1966. 193 pp. (UNCLASSIFIED).
H. M. West.

Most of the research for this report was conducted to develop staffing criteria for training devices used throughout the Navy. The findings are applicable to minor devices (issue and maintenance) and major devices (maintenance and operational) for aviation, surface, and subsurface training devices. The special methods used and the data collection instruments are briefly described herein. Recommendations presented involve civilian replacement of Tradevmen and rotation of Tradevmen within specialities, tour of duty extensions, and an overall manpower management system improvement.

Staffing Criteria for AO-22 and AO-143 Class Oilers. U. S. Navy Staffing Criteria Manual for Activities Afloat. OPNAVINST 5310.6A. PRL Wash., D. C. June 1966. D. Wedding, H. M. West, and A. Anderson.

Relationship of Generalist Officer and Specialist Officer Concepts. PRL Working Paper. Unnumbered. Wash., D. C. July 1966. C. A. Hart, and W. L. Himes.

> Due to the increased educational requirement inherent in the new technological developments, the Navy was faced with several problems which became apparent during World War II. Background information on findings of a series of Boards which convened, and numerous professional articles, revealed the need to appraise the role qualitatively and quantitatively of the Unrestricted Line Officer and the Special Duty Officer. A main objective of this study was to set forth information on available requirements for P- and S- coded billets and the optimum number of officers required to fill these billets.

Total Officer Personnel System for the Future (TOPS), Phase I (Proposed Officer Classification and Coding System for the Next Decade). PRL Report No. WRM 67-1. Wash., D. C. July 1966. W. L. Himes, E. M. Hubbs, and J. M. Pugh.

> Preliminary results of the first phase of research on the Total Officer Personnel System is contained in this memorandum.

Phase I is concerned with the officer classification and coding system, with standards (criteria) for assignment of codes. It must meet the Navy's needs in the next decade; be designed to make advantageous use of data processing equipment and procedures; and provide maximum assistance to manpower managers in personnel management and administration decision making.

A hypothetical structure is presented to serve as the basis for the design of the future system through test and evaluation of the classification elements (structures) and various methods of obtaining digital coding significance.

Fleet Ballistic Weapons System Statistics: Manning Status and Trainee Averages. PRL Report No. WRM 67-5. Wash., D. C. August 1966. 39 pp. (UNCLASSIFIED). L. H. Kernodle.

Summarized within this report are the following: Manning status on board 41 SSB(N)'s; comparisons between allowances and personnel on board for instructors at Fleet Ballistic Missile Weapons System Training Activities, and Weapons System personnel at the Polaris Missile Facilities, and quarterly statistics for students entering into training at the FBM Department, Guided Missiles School, Dam Neck, Virginia. Because of the nature of this study, this report will not be distributed to DDC.

Naval Officer Wet/Dry Career Concepts. PRL Staff Paper. Unnumbered. Wash., D. C. August 1966. J. M. Pugh.

An analysis was made of the Royal Navy system for selecting officers of the Seaman Specialty for sea or shore utilization in the senior grades, and compared to the USN system with emphasis upon implications affecting "full careers for officers who do not screen for command at sea."

The indications are that the major differences between the RN solution of "wet" and "dry" lists and the USN Subspecialization is in the matter of early, irrevocable selection for opportunity for major command at sea. The RN makes the selection about midway in an officer's career, around 35 years of age, while the USN keeps flexible with selections for deep draft command late in the officer career pattern.

The U. S. Navy should not adopt the "wet" and "dry" concept of the Royal Navy, but should refine and improve its present system in the area of technical subspecialization for URLOs.

Staffing Guide for all Classes of AR Type Ships. PRL Report No. WRM 67-2. Wash., D. C. August 1966. 220 pp. (UNCLASSIFIED). T. C. Gentel.

Staffing criteria were developed for all functions and subfunctions performed on AR Type ships (tenders). Background information, methods used, rationale and assumptions made in conducting studies are included. Present manpower authorizations for each ship studied are compared with the recommended staffing criteria to show the impact on the current allowance for each ship. A complete set of staffing tables covering all classes of AR Type ships is appended.

Staff Paper: Recommendation to Establish NECs for Musician Rating. PRL Staff Paper. Unnumbered. Wash., D. C. August 1966. W. R. Carraway.

Study was initiated upon a request submitted by the Music Branch (Pers-G16), BuPers, to establish NECs identifying instrumentalists, vocalists, conductors, arrangers, and librarians.

It is indicated that a requirement does exist for establishment of NECs for the MU Rating for the purposes of distribution and detailing, and a list of these NECs are presented in this paper.

Staff Study on Feasibility of Expanding MA NECs for Effective Use of Personnel in the MA Rating. PRL Staff Paper. Unnumbered. Wash., D. C. August 1966. W. R. Carraway and S. J. Suser.

This study is based on a request submitted by Commanding Officer, Enlisted Personnel Distribution Office, Continental United States (EPDOCONUS) to expand the number of MA Rating NECs from 8 to 20. Recommendations concerning the feasibility of expanding MA NEC and clarifying the responsibility of the MA Rating for computer operators, programmers, and analysis throughout the Navy are contained herein.

U. S. Navy Staffing Criteria Development Program: Seminar Orientation Outline. PRL Handbook. Unnumbered. Wash., D. C. August 1966. W. T. Lyons.

Information is presented in the form of a briefing. It is intended to provide guidance to bureaus, offices, and commands in developing and maintaining staffing criteria for functions and subfunctions under their respective cognizance. (This outline was expanded on and reported in U. S. Navy Staffing Criteria Development Program, Handbook for Staffing Criteria Development for Activities Ashore, December 1966.)

Job Evaluation: A Study of Selected Systems and Their Application to Navy Enlisted Billets. Report No. WRM 67-3. September 1966. 74 pp. (UNCLASSIFIED). A. J. Rose.

This is the second in a series of research reports on the design and development of a billet evaluation system for Navy enlisted billets. This report presents an assessment of selected military, industrial, and government job evaluation systems and their possible application to the design of a Navy billet evaluation system.

The next phase of this research project will be a report on the type of system for Navy use.

Qualifications and Related Training for Naval Reserve Officers (1105) Naval Warfare/Operations, Surface Mine Warfare. PRL Report No. WRM 67-4. Wash., D. C. September 1966. 22 pp. (UNCLASSIFIED). C. A. Hart.

This memorandum reports on the development of qualifications standards and related training for all 1105 officers assigned to the Mine Warfare (M/W) Program.

These qualifications standards were developed as a part of the professional development system for Naval Reserve officers not on active duty. It should be noted that the Mine Warfare (M/W) qualifications outlined are in addition to the requirements for all 1105 officers outlined in NAVPERS 15988-1. The conclusion reached was that the addition of type warfare qualifications Mine Warfare (M/W) is a logical step of professional training in the professional development system.

Staffing Criteria for Guided Missiles School. U. S. Navy Staffing Criteria Manual for Activities Ashore. OPNAVINST 5310.5A. PRL. Wash., D. C. September 1966. A. O'Sullivan, H. M. West, G. Robinson, and A. J. Barnett.

Staff Paper on Feasibility of Establishing an NEC for Petroleum Procurement Inspector. PRL Staff Paper. Unnumbered. Wash., D. C. September 1966. W. R. Carraway.

A recommendation concerning the advisability of establishing a Navy Enlisted Classification Code (NEC) for the billet of Petroleum Procurement Inspector was submitted by Commanding Officer, U. S. Navy Fuel Supply Office, Cameron Station, Virginia.

A recent shortage of officer personnel and the difficulty of obtaining qualified civilians to go to such stations as Vietnam prompted the Commanding Officer to recommend that the billets of Petroleum Procurement Inspectors be converted from officer to enlisted. These billets are currently filled by officers and civilians.

Staff Paper on Recommendation to Establish an NEC for Dock Control Pumper. PRL Staff Paper. Unnumbered. Wash., D. C. September 1966. W. R. Carraway.

Initiation of this study was based on a recommendation submitted by Commanding Officer, USS ALAMOGORDO ARDM-2. Results indicate that no NEC be established to identify the skill of Dock Control Pumper as such skill is currently identified as part of NEC 9523. Utilization of this NEC could be extended to identify personnel performing dock control pumping operations.

Job Analysis: An Assessment of Applicability of Analysis Systems of Other Services to Navy Enlisted Billets. PRL Report No. WRM 67-9. Wash., D. C. November 1966. 48 pp. (UNCLASSIFIED). M. E. Johnson.

As a basis for approaching the development of a Navy job analysis system, the standard procedures in job analysis are analyzed and reviewed, together with recent developments in the field. Limitations upon the research are identified, and some of the underlying assumptions are indicated. Criteria for a Navy job analysis system are proposed.

Industrial and governmental practices in job analysis are discussed, particularly the systems followed by the U. S. Marine Corps, the U. S. Air Force, and by the U. S. Department of Labor are also examined.

It is concluded that, while certain aspects of the Air Force and Marine Corps job analysis systems may pertain to the Navy, a job analysis system which is satisfactory for the Navy must be developed to accommodate the Navy's unique characteristics and requirements.

Job Evaluation: Selecting the Type of System for Navy Use. PRL Report No. WRM 67-7. Wash., D. C. November 1966. 21 pp. (UNCLASSIFIED). A. J. Rose.

This is the third in a series of research reports leading to the design and development of a billet evaluation system for Navy enlisted billets. This report analyzes and reviews the four conventional methods of job evaluation in terms of their application to Navy billets.

The report concludes that the point rating method of job evaluation is the best technique for determining the relative value of Navy billets. It recommends that work proceed on developing the details of a point rating system tailored to the mission and needs of the Navy.

Preliminary Design of a Classification Coding Structure Combining Navy Officer Designators, NOBCs, and Subspecialty Codes. PRL Staff Paper. (Informal Review Draft). Unnumbered. Wash., D. C. November 1966. J. M. Pugh, and H. A. Parrack.

This material was delivered informally to representatives of cognizant divisions of the Bureau of Naval Personnel and Naval Operations about 1 November 1966. Comments favored simplification of the present officer classification coding system and considered the preliminary design worthy of further study.

The specific problem of this paper was to make a preliminary determination of the feasibility of combining the present Designator, NOBC, and Subspecialization classification coding structures into one structure of the fewest digits possible to meet predictable future needs.

Qualifications and Related Training for Naval Reserve Officers (1105) Naval Warfare/Operations, Surface: MSTS and Naval Control of Shipping Organization. PRL Report No. WRM 67-9. Wash., D. C. November 1966. 61 pp. (UNCLASSIFIED). C. A. Hart.

This memorandum reports on the development of qualifications standards and related training for all 1105 officers assigned to the MSTS/NCSORG Program.

These qualifications standards were developed as a part of the professional development system for Naval Reserve officers not on active duty. It should be noted that the MSTS/NCSORG qualifications outlined in this memorandum are in addition to the requirements for all 1105 officers outlined in NAVPERS 15988-1.

The conclusion reached was that the addition of type warfare qualifications MSTS/NCSORG is a logical step of professional training the professional development system.

Staffing Criteria for All Classes of Submarine Tenders. U. S. Navy Staffing Criteria Manual for Activities Afloat. OPNAVINST 5310.6A. PRL. Wash., D. C. November 1966. A. Bright, M. Lockett, A. Anderson, PNC H. Gardner, K. Witham, D. Wedding, and T. Gentel.

Staffing Guide for All Classes of Destroyer Tenders. U. S. Navy Staffing Criteria Manual for Activities Afloat. OPNAVINST 5310.6A. PRL. Wash., D. C. November 1966. A. Anderson, PNC H. Gardner, K. Witham, D. Wedding, and T. Gentel.

Design to Simplify the Navy Officer Classification Coding System. PRL Report No. WRM 67-17. Wash., D. C. December 1966. 16 pp. (UNCLASSIFIED). J. Pugh and H. Parrack.

This research memorandum contains a preliminary design for simplification of a future Navy Officer Classification coding system. It is the second report for Phase I of research on the Total Officer Personnel System (TOPS). This report should be considered in conjunction with the first report of this phase, WRM 67-1 of July 1966, entitled Proposed Officer Classification and Coding System for the Next Decade.

The Impact of the Standard Navy Maintenance and Material Management (3-M) System on Qualifications for Advancement in Rating and Navy Enlisted Classifications. PRL Staff Study. Unnumbered. Wash., D. C. December 1966. B. T. Litton.

This study presents information on the impact of the 3-M System on the Enlisted Qualifications for Advancement in Rating and Navy Enlisted Classifications. Some of the salient elements are: review of references concerning the 3-M System; studies being conducted; listing of ratings that have been reviewed with 3-M standards being reflected; NEC Codes that have been developed reflecting 3-M standards; and recommended actions to complete the updating of NAVPERS 18068B and NAVPERS 15105 to reflect requirements of the 3-M System.

Navy Staffing Criteria Development Program; Handbook for Staffing Criteria Development for Activities Ashore. PRL Handbook. Unnumbered. Wash., D. C. December 1966. W. T. Lyons.

This information is intended to provide guidance to bureaus, offices, and commands in developing and maintaining staffing criteria for functions and subfunctions under their respective cognizance. Included are objectives, policies, responsibilities, and qualitative controls of the U. S. Navy Staffing Criteria Development Program for Activities Ashore, together with detailed procedures on how to develop staffing criteria by various methods and techniques. Included also are procedures on how to maintain and keep the criteria current and responsive to the needs of the users. It is recommended that this handbook be used until the official manual for the U. S. Navy Staffing Criteria Development Program for Activities Ashore can be promulgated by the Chief of Naval Operations (OP-01B1) in the near future.

Qualifications and Related Training for Naval Warfare/Operations, Surface, Amphibious Warfare. PRL Report No. WRM 67-14. Wash., D. C. December 1966. 63 pp. (UNCLASSIFIED). C. A. Hart.

This research memorandum reports on the development of qualifications standards and related training for all 1105 officers assigned to the amphibious component of the Naval Reserve.

These qualifications standards were developed as a part of the Professional Development System for Naval Reserve Officers Not on Active Duty. It should be noted that the Amphibious Warfare qualifications outlined in this research memorandum are in addition to the requirements for all 1105 officers outlined in NAVPERS 15988-1.

The conclusion reached was that the addition of type warfare qualifications for Amphibious Warfare is a logical step of professional training in the professional development system.

Staff Paper: Analysis of 737 Staffing Criteria Evaluation Reports for Activities Ashore. PRL Staff Paper. Unnumbered. Wash., D. C. December 1966. R. B. Twight, and A. W. Bright.

The purpose of this report is to analyze Staffing Criteria Evaluation Reports, OPNAV Form 5312-9 (9-64), completed by the U. S. Navy Manpower Validation Teams of the Navy Manpower Validation Division (OP-83), and compare the manpower recommended by the various manpower validation teams for functions and subfunctions with the staffing criteria from the U. S. Navy Staffing Criteria Manual for Activities Ashore, OPNAVINST 5310.5A.

Staff Study on Recommendation to Revise Navy Enlisted Classification Codes SF-4915 Through SF-4918 on Nondestructive Testing. PRL Staff Study. Unnumbered. Wash., D. C. November 1966. A. M. Boroski, and P. Buehler.

An analysis was made to determine the feasibility to restructure the Navy Enlisted Classification Codes (NECs) SF-4915 through SF-4918, identifying nondestructive testing skills, (NDT).

The USS SIMON LAKE recommendation was to establish 16 NEC Codes (included in Appendix A) which would identify each of the four nondestructive test methods (radiography, ultrasonic, magnetic particle, and dye penetrant) at three levels; i.e., Operator/Inspector, Supervisor, and Examiner. The intent was to identify those personnel qualifications necessary to support afloat repair activities in maintaining material certifications NDT technology.

It is recommended not to expand the present NDT codes, but to revise the codes to identify the present changes in NDT, training, certification, and distribution control.

Total Officer Personnel System for the Future (TOPS), Design to Simplify the Navy Officer Classification Coding System. PRL Report No. WRM 67-17. Wash., D. C. December 1966. H. A. Parrack and J. M. Pugh.

This research memorandum contains a preliminary design for simplification of a Navy officer classification coding system for the future. It is the second report for Phase I of research on the Total Officer Personnel System (TOPS), WRM 67-1 of July 1966, entitled Proposed Officer Classification and Coding System for the Next Decade.

The design of a single core classification coding structure was undertaken as a result of comments from representatives of offices and divisions responsible for manpower management and personnel administration concerning material contained in WRM 67-1. This report considers a combination of Navy officer designators, NOBCs, and subspecialty classifications into one simplified structure.

Techniques for Determining Relative Importance of Advancement Qualifications. PRL Report No. WRM 67-22. Wash., D. C. January 1967. 31 pp. (UNCLASSIFIED). T. B. Turner.

The Study Group on Advancement, meeting in the Bureau of Naval Personnel in early 1966, recommended that a study be made of possible ways and means of rank ordering, the qualifications for advancement. Such procedures would in turn allow the forwarding of valuable occupational information of frequency of use, time spent performing, and criticality of qualifications for advancement to examination item writers, correspondence course writers, and training publications writers.

The major conclusions of this report are:

1. The rating scale job inventory is the most economical method to acquire information concerning the relative importance of advancement qualifications.

2. A rating scale to measure both criteria of importance and frequency of use should meet the immediate needs of the consumers as indicated by the Study Group on Advancement.

Job Analysis: Selecting the Type of System for Navy Use. PRL Report No. WRM 67-23. Wash., D. C. February 1967. 21 pp. (UNCLASSIFIED). M. E. Johnson.

This is the second in a series of research reports, the principal objective of which is to design and develop a multi-purpose occupational analysis system. The system will provide current, accurate, detailed information for users of occupational data, and will also serve as a basis for further studies in associated fields of personnel management.

In the phase of the study reported here, methods of occupational analysis used by other military services and the Department of Labor, reported previously, are reviewed briefly and appraised in terms of their applicability to Navy billets. A method for developing an occupational analysis system suitable to the Navy is proposed. It employs the most recent advances in the techniques of collecting, analyzing, storing and retrieving occupational information. The method proposed calls for the establishment of a computerized occupational data bank, and for the use of billet inventories in the collecting of occupational information.

The report recommends that the proposed method be used to conduct an occupational analysis of the Boatswain's Mate and Radioman ratings, and that this work be considered as a pilot test of the method for its subsequent application to all Navy enlisted billets.

Determination of Qualifications for Mine Warfare Personnel. (Conference). PRL. Wash., D. C. March 1967. M. D. Callahan.

Time in Pay Grade and Length of Active Service Characteristics of the Navy Enlisted Force. SRM 67-17. March 1967.

This research memorandum consists of a computer printout of several hundred pages designed for internal use by the Active Enlisted Plans Branch (Pers-A12) of BUPERS. It is one of a series of such end products designed to provide those responsible for enlisted personnel planning functions with data for use in decision making heretofore not available. It contains data describing the active enlisted personnel force by length of service and time in pay grade in several categorical breakdowns. These data will provide useful support for many planning functions, such as the study of career patterns, checking for data report discrepancies, and considering policy changes such as compulsory retirement for personnel with extensive time in rate.

Enlisted Advancement Planning Document for May-October 1967. SRM 67-20. April 1967.

This report designed for internal use by the Enlisted Advancement Plans Section (Pers-A122) of BUPERS, consists of a computer printout resulting from the application of the ADPLAN Model to the May-October 1967 advancement planning process. The purpose of this model is to automate as much as possible the advancement planning process, the original version of the ADPLAN Model is described in a report by Conner and May (SRR 66-21 of June 1966).

Development of Guidelines and Criteria for Validation of Postgraduate (P-Coded) Billets. PRL Staff Paper. Unnumbered. Wash., D. C. (Staff Papers). April 1967. J. M. Pugh and H. A. Parrack.

Research was undertaken to develop guidelines and criteria in terms of definitive standards to be used in the determination and identification of functional duties within officer billets which require and justify postgraduate education of incumbents.

The specific problem of this paper is to assess previous concepts and studies which bear upon officer billet educational requirements, especially PG; and propose feasible technical approaches for development of the guidelines and criteria for P-Codings requested by the Assistant Chief of Naval Personnel for Personnel Control. It is a part of the research into development of the Total Officer Personnel System (TOPS) for the future, and is for review and comment.

An Analysis of Fleet Ballistic Missile Weapons Systems Manning and Training. PRL Report No. WRM 67-48. Wash., D. C. June 1967. 109 pp. (UNCLASSIFIED). L. H. Kernodle.

This report contains information in support of recommendations to establish a Fleet Ballistic Missile Weapons System Technician general rating, within Navigation (FWN) and Weapons (FWW) Speciality Service ratings; and to formalize a junior system technician concept development. Present system practices and procedures were examined and analyzed, and the resultant effects from establishing a new system are discussed as they pertain to technicians' duties and allowances; prerequisites for personnel entry into system training, technician training pipelines, including Class "A" and Class "C" training; patrol procedures: off-patrol refresher training; senior system technician development, including Class "B" School; qualifications for advancement in rating; and technicians speciality proficiency pay incentive award procedures.

Comparative Analysis, Navy/Commercial Manning for YTB's, YTM's and YTL's. PRL Report No. WRM 67-50. Wash., D. C. June 1967. 45 pp. (UNCLASSIFIED). T. G. Gentel and M. W. Lockett.

A comprehensive study was conducted to determine staffing requirements for Navy harbor tugboats, Types YTB, YTM and YTL; and concurrently to surface any problems that could be rectified that would improve operation and crew morale. A companion study was conducted simultaneously to determine how commercial towing companies determine their staffing requirements for harbor tugboats, with the thought that there might be a transfer of knowledge that would prove useful to the Navy. Based on the research that was conducted at harbors on both the East and West coasts, a series of findings and recommendations were made that should provide beneficial to the operation of Navy harbor tugboats and increase the morale of the crews.

Change 4 to Manual of Navy Officer Classifications, NAVPERS 15839A. August 1967. Wash., D. C. 253 pp. (UNCLASSIFIED). N. F. Jarvis, E. M. Hubbs, and E. G. True.

Changes are published annually to ensure that the contents of the manual reflect the impact of the latest operational and technological developments on the Navy Officer Classification system. Change 4 consisted of: (1) 23 added classifications, (2) 80 revised classifications, and (3) 147 deleted classifications (including all L-codes), as well as a revised introduction and a revised table of Navy-civilian occupational relationships (officer).

Manual of Navy Enlisted Classifications. NAVPERS 15105M. August 1967. Wash., D. C. 124 pp. (UNCLASSIFIED). B. T. Litton.

This Manual is revised semi-annually to ensure current and timely identification of codes and billet requirements. The three types of NEC's listed in Part I of this Manual are entry, series, rating series, and special series.

Part II contains NEC codes used only for projecting requirements in manpower authorizations. These codes, when fully developed as rating or special series codes, are inserted in Part I of the Manual.

Minimum Paygrades for Navy Enlisted Classifications. August 1967. Wash., D. C. 16 pp. (UNCLASSIFIED).

This supplement to the Manual of Navy Enlisted Classifications, NAVPERS 15105 (series) lists minimum paygrades at which Navy Enlisted Classification Codes may be acquired by enlisted personnel in their normal path of advancement. It has been developed in response to a request from the Chief of Naval Operations to provide guidance in assessing the appropriate paygrade at which to assign an NEC to a billet on manpower authorizations.

Identification of Navy Storekeepers Qualified for Independent Duty. WSS 68-10. October 1967. Wash., D. C. 9 pp. (UNCLASSIFIED). G. M. Bowden.

This study was conducted to: (1) analyze and determine the need for a Navy Enlisted Classification Code (NEC) to identify storekeepers qualified for independent duty aboard submarines without Supply Corps officers and (2) determine the necessity for identifying other independent duty requirements through the use of Special Series NEC's.

Comparative Analysis of Navy/Commercial Manning of YTB, YTM, and YTL Type Tugboats. WRM 68-8., November 1967. Wash., D. C. 39 pp. (UNCLASSIFIED). T. G. Gentel and M. W. Lockett.

This comprehensive research study was conducted to determine staffing requirements for Navy harbor tugboats, types YTB, YTM, and YTL; and concurrently to surface any problems that could be rectified to improve operations and manpower utilization. A comprehensive study was conducted simultaneously to determine how commercial towing companies arrived at their staffing requirements, with the thought that there might be a transfer of knowledge that would prove useful to the Navy. Based on the research that was conducted at harbors on both East and West Coasts, a series of findings and recommendations were made that should prove beneficial to the operation of Navy harbor tugboats.

New Techniques in Task Analysis. SRM 68-12. November 1967. Joe Silverman.

This research is directed toward the investigation of recent developments in techniques of task analysis. Because of methodological problems associated with the development of training curricula, the analysis of man/machine systems, and occupational analysis, it has been proposed that a task taxonomy be developed. Such a taxonomy would indicate the inherent similarities between tasks, independent of their environment, and pave the way for improvements in training, billet structure developments, and improved manpower utilization.

There have been numerous attempts at developing task taxonomies--both quantitative and qualitative. At present, the results of these efforts have not been comprehensive enought, nor suitable for use throughout the Navy. Because of recent developments in other sciences, a small effort was devoted to investigation of the possible application of these new techniques to personnel systems problems in the Navy.

Problems of task classification can be approached more systematically through methods of numerical taxonomy than through traditional techniques. Numerical taxonomy places the procedures of task comparison and classification on an operational and quantitative basis. This makes it possible for the Navy to objectively and precisely evaluate its billet and rating structure.

Since this research was initiated a short time ago, with a modest budget, the primary effort has been devoted to an investigation of the state-of-the-art. As a result of this initial inquiry, it is concluded that the application of techniques of numerical taxonomy to problems of task analysis is warranted because of its usefulness in helping to solve problems relating to the Navy's personnel systems.

A Preliminary Report on the Feasibility of Organizational Research in the Navy. SRR 68-8. November 1967. Joe Silverman.

This report presents the results of a preliminary review of the literature in organizational theory, with special emphasis on its feasibility for application to problems of Navy organizational units. The objective of such research would be the development and improvement of naval organizational structures and functions through the use of advanced techniques which integrate organizational theory, modern mathematical methods, and computer technology.

A program of organizational research is delineated in terms of the impact of technological change on organizational structures and manpower utilization, which is so manifest in the area of ship and weapons systems design. Such a program would focus on organization structure and design, decision and control processes, measures of organizational effectiveness, intraorganizational communications, and organizational adaptability to change.

Some of the problems of Navy shipboard organization in particular, and problems of organizational theory in general, which are discussed include those of organizational goals and purposes, structure and design, and decision-making.

The SAMOA Method of Determining Technical, Organizational, and Communicational Dimensions of Task Clusters. STB 68-5. November 1967. Malcolm J. Carr.

This report describes a pilot study of a research *method* for collecting and analyzing occupational information to be used as a major input for the development of an occupational classification structure suitable for the next decade. This approach is termed the "SAMOA" method (Systematic Approach to Multidimensional Occupational Analysis). The pilot study demonstrates the technical feasibility of the method for determining current work requirements.

The rationale upon which the research was based is that (a) the enlisted occupational classification structure must be based upon valid work requirements; (b) current methods for determining work requirements on a large scale are too slow, too subjective, and limited primarily to the technical dimensions of work; and, therefore, (c) development of improved procedures for determining work requirements is a necessity.

The SAMOA method consists of two major phases: (1) Specification of specialty areas by means of a computerized clustering program which identifies relatively homogeneous work groups on the basis of similarity of task patterns; and (2) stratifying such groups (*clusters*) on the basis of Technical, Organizational, and Communicational *variables* by means of a set of computerized procedures. Indices of these variables form the basis for *cluster profiles* which constitute the primary input for an occupational classification structure.

Continuing research will be directed toward determining the practical feasibility of SAMOA as a Navy-wide data-gathering technique, on the basis of manpower and computer capabilities required.

U. S. Navy Master Chief Petty Officer and Senior Chief Petty Officer Rating Compression Analysis. WSS 68-14. November 1967. Wash., D. C. 7 pp. (UNCLASSIFIED). A. M. Boroski.

This study was conducted to review existing senior and master chief petty officer (E-8/E-9) rating compressions in light of the findings of the 1967 E-8 and E-9 Survey with a view towards developing modifications to these compressions to meet the needs of today's Navy.

Analysis of Torpedoman's Mate Rating Structure. WSS 68-15. December 1967. Wash., D. C. 23 pp. (UNCLASSIFIED). R. R. Seiler.

This paper presents personnel and management problems associated with the Torpedoman's Mate rating, and sets forth recommendations resulting from an analysis of the TM rating structure in an effort to find solutions to existing problems.

Conditional Manning Document, BB-61 Battleship. December 1967. Wash., D. C. 342 pp. (UNCLASSIFIED). K. E. Witham, et al.

Ship Manning Document, DD-710 (FRAM 1) Class Destroyer. December 1967. Wash., D. C. 147 pp. (UNCLASSIFIED). K. E. Witham, et al.

Manual of Navy Enlisted Classifications. NAVPERS 15105N. February 1968. Wash., D. C. 124 pp. (UNCLASSIFIED). B. T. Litton.

This manual is revised semi-annually to ensure current and timely identification of codes and billet requirements. The three types of NEC's listed in Part I of this Manual are entry, series, rating series, and special series.

Part II contains codes used only for projecting requirements in manpower authorizations. These codes, when fully developed as rating or special series codes, are inserted in Part I of the Manual.

Minimum Paygrades for Navy Enlisted Classifications. February 1968. Wash., D. C. 16 pp. (UNCLASSIFIED).

This supplement to the Manual of Naval Enlisted Classifications, NAVPERS 15105 (series) lists minimum paygrades at which Navy Enlisted Classification Codes may be acquired by enlisted personnel in their normal path of advancement. It has been developed in response to a request from the Chief of Naval Operations to provide guidance in assessing the appropriate paygrade at which to assign an NEC to a billet on manpower authorizations.

Changes to Navy Occupational Specialties in DOD Occupational Table, DOD 1312.1-0. February 1967. Wash., D. C. 124 pp. (UNCLASSIFIED).

These changes reflect those published in Change 4 to the Manual of Navy Officer Classifications, NAVPERS 15839A, and are reported to DOD, Office of the Assistant Secretary of Defense, Manpower for inclusion in the publication, Occupational Conversion Table, Officer, DOD 1312.1-0, superseding the March 1967 edition. The latter publication is a compilation of commissioned and warrant officer and occupational specialty groupings in the Army, Marine Corps, and Air Force, and billet classification codes in the Navy under a common Department of Defense occupational grouping and numerical coding system.

Ship Manning Document, DDG-2 Class Guided Missile Destroyer (Revision No. 1). April 1968. Wash., D. C. 160 pp. (UNCLASSIFIED). K. E. Witham, et al.

The Ship Manning Documents portray quantitative and qualitative battle manning requirements derived through the application of selected work study techniques to basic manning criteria. Adapts four groups of manning criteria to constraints of doctrine, and the size and configuration of the ship. Operating, maintenance, administrative, and housekeeping work demands can be traced to the mission, tasks, and scenarios established by the Chief of Naval Operations. The studies are in a format which permit cost study analysis of all functions performed and a comparison between calculated work demands and target work week objective. Documents are used as a management tool by the Chief of Naval Operations for deriving ship manpower authorizations.

Distribution of these documents is controlled by the Office of the Chief of Naval Operations (OP-100) on a need-to-know basis.

Conditional Manning Document, BB-61, Change 1. May 1968. Wash., D. C. 353 pp. K. E. Witham, et al.

Battle Manning requirements for the BB-61 are derived and portrayed in the same manner as for the DD/DDG classes except that Conditional Mannning Requirements resulting from the imposition of personnel resources constraints are also provided.

Distribution of these documents is controlled by the Office of the Chief of Naval Operations (OP-100) on a need-to-know basis.

A Study to Determine the Feasibility of Incorporating All Officer Codes Structures into One Publication. WSS 68-31. May 1968. Wash., D. C. 33 pp. (UNCLASSIFIED). N. F. Jarvis.

A comprehensive study was conducted to determine the various code structures used in the identification of naval officers in personnel and manpower documents. The use of these code structures was considered and a recommendation was made that all code structures which have significance throughout the Navy be incorporated into the Manual of Navy Officer Classifications. It was also recommended that a coordinating office be established for the Officer Classification System.

A Study to Improve Identification of Aircraft Maintenance Skills and Knowledges (NECs 8301 -8395). WSS 68-29. May 1968. Wash., D. C. 65 pp. (UNCLASSIFIED). B. T. Litton.

Staff study concerning the identification of aircraft maintenance skills and knowledges (NECs 8301 - 8395). It recommends that a number of current Navy Enlisted Classification (NEC) codes be revised and that a number of new NEC's be established to provide better identification of aircraft maintenance skills and knowledges for use in personnel administration functions (e.g., distribution and training).

A Study of Staffing Requirements for Navy Oceangoing Tugboats, ATA, ATF, and Salvage Ships, ARS. WRM 68-14. June 1968. Wash., D. C. 58 pp. (UNCLASSIFIED). T. G. Gentel and T. J. Rademaker.

This comprehensive research study was conducted to determine optimum staffing requirements for ATA Type Auxiliary Ocean Tugboats, ATF Type Fleet Ocean Tugboats, and ARS

Type Salvage Ships. Problems pertaining to personnel, manpower utilization and operations were surfaced and studied for possible correction, as well as staffing by commercial towing companies, but owing to various differences in mission, ship size, equipage, and crew stability, it was not possible to make meaningful comparisons between the staffing of U. S. Coast Guard, commercial, and U. S. Navy oceangoing tugboats. Changes in existing naval staffing and ship deployment practices considered conducive to more optimum ship/manpower utilization are proposed for each of the ship types.

A Study to Improve Identification of Dockmaster and Floating Drydock Control Pumper Skills and Knowledges (NECs 9523 and 9524). WSS 68-32. June 1968. Wash., D. C. 16 pp. (UNCLASSIFIED). B. T. Litton.

Staff study concerning the identification of Dockmaster skills/knowledges and Floating Drydock Control Pumper Skills and knowledges. Recommendations for improving the identification of these essential skills and knowledges are contained in this study.

Proposed Techniques for Determining the Relative Importance of the Advancement Qualifications. WRR 69-3. September 1968. (UNCLASSIFIED). M. D. Callahan, N. A. Hrutkay, T. B. Turner, and A. J. Rose.

This research report describes the data reduction and analysis phase of the proposed techniques for determining the relative importance of Navy advancement qualifications. The quantitative techniques are applied to the data collected through the Data Systems Technician survey and are deemed suitable for the treatment of similar data on all Navy evaluative support to the writers of advancement examinations, training publications writers, and personnel engaged in updating qualifications for advancement in rating.

A Tabulation of Officer Losses from Four Designator Communities (FY-1962 through FY-1967). SRM 69-18. January 1969. John S. Malone and Robert P. Thorpe.

This report is a computer printout which contains tabulations of the numbers of male officers lost for seven selected reasons from fourteen officer sources in four designator communities (namely, 110X, 131X, 132X, and 135X) during each fiscal year from 1962 through 1967. These losses include both those losses from active duty strength as well as those losses due to a change of designator without a change in active duty status. (NOT AVAILABLE FOR DISTRIBUTION)

Classification Model for Officers and Enlisted Personnel Associated with the Deep Submergence Vehicle Program. WRM 69-18. March 1969. (UNCLASSIFIED). H. M. Worth.

This report establishes a classification structure for officer and enlisted personnel associated with the Deep Submergence Vehicle Program. The Naval Officer Classification NOC-9322 and the Naval Enlisted Codes NEC 3501, 3503, 3505, and 3507 are intended for the immediate use of planners concerned with the training distribution, and detailing of personnel associated with the deep submergence rescue vehicle (DSRV) program.

The Special Qualification/Special Designation (SQ-SD) identifies 015 Deep Submergence Vehicle Operator has been established for immediate use in the officers automated record. This input to the automated record allows for quick retrieval of personnel who are certified as deep submergence vehicle operators.

Design of an Optimum Navy Enlisted Classification Structure: Preliminary Report on Current Needs and Problem Areas. WRM 69-19. May 1969. (UNCLASSIFIED). N. A. Hrutkay, R. L. Black and W. R. Carraway.

This report presents a compilation of information bearing on the administrative operations of the NEC system acquired through interviews with 66 Navy and civilian personnel at 35 naval establishments.

Included in the forepart of the report is an analysis of the data and information pertaining to problems encountered with the use of the NEC Manual, billet identification, detailing personnel to billets, BUPERS-EPDO-PAMI-TYCOM administrative operations, personnel cross-trained by OJT, Enlisted Personnel Schools Data System, the Enlisted Rating Structure, and Navy Aviation NECs.

Included in the latter portion of the report is a presentation of the interviewees' opinions regarding paygrading NECs, and their comments relative to the need of an all-digit NEC/MOS/AFSC type coding system. NECs to identify personnel with supervisory and managerial skills, advancement examinations based on NECs, and a method of skill-level progression appropriate to the identification of four-year obligor (enlisted) requirements.

Enlisted Billet Evaluation: Selection and Pilot Test of Factors for Navy Use. WRM 69-27. May 1969. (UNCLASSIFIED). A. J. Rose and R. B. Wethy.

This research report deals with the development and pilot test of a job evaluation system designed to reflect specific requirements of Navy enlisted billets. The report assesses the effectiveness of an information gathering instrument. Designed for use in a closely related project (Design of Navy Occupational Analysis Systems) i.e., as a method for obtaining occupational information for use in evaluating billets.

Job Analysis: Design of a System for Navy Use. WRM 69-22. May 1969. (UNCLASSIFIED). M. E. Johnson and R. B. Wethy.

The report describes the design, development, and pilot test of procedures for an occupational analysis system suitable for Navy use. Sample print-outs, tables, and charts reflecting end products of the system are presented. A Navy-wide field test of the system under operational conditions is recommended as a step in establishing a Navy Occupational Data Bank.

Design of an Optimum Navy Enlisted Classification Structure: Report on the Effects of Substituting NECs for Service Ratings. WRM 70-4. July 1969. 53 pp. (UNCLASSIFIED). N. A. Hrutkay and J. P. Williams.

This report contains an analysis of the data and information acquired from Rating Control Managers and other cognizant personnel regarding the effectiveness of the Service Ratings for personnel skill identification, detailing and assignment and their comments relevant to the effects of substituting NECs for Service Ratings. The first part of the report presents: (1) a chronology of the NEC coding system and the Service Rating Structure, (2) a listing of the existing Service Ratings which are the subject of this study, (3) an enumeration of the Service Rating NECs, and (4) the number of Petty Officers by paygrade who are likely to be affected by the substitution of NECs for Service Ratings.

The remainder of the report includes a description of the problems encountered in detailing and assigning personnel in Service.

Ratings, and proposals for effecting the substitution of NECs for Service Ratings to improve the assignment and utilization of personnel.

Improvement of the Navy Officer Classification Coding System. WRM 70-10. July 1969. 50 pp. (UNCLASSIFIED). J. M. Pugh, H. A. Parrack and H. Linsert.

Proposals and recommendations concerning improvement of the Navy Officer Classification System are presented. It is intended for consideration by all users of the system, and it is expected that valuable guidance for further research will result from their comments.

Design of an Optimum Navy Enlisted Classification Structure: Paygrading Navy Enlisted Classifications (NECs). WRM 70-15. August 1969. 50 pp. (UNCLASSIFIED). G. L. Lane and C. T. Marshall.

This report presents a description of the research leading to the development of the essential factors for the determination of NEC paygrades, i.e., assignment of a minimum paygrade at which an NEC may normally be acquired and a maximum paygrade above which an NEC will normally be deleted from the NEC inventory.

Includes descriptions of the various elements related to the distribution/detailing of NEC identified personnel, the problems associated with NEC billet assignments, and the comments of personnel managers regarding the paygrading of NECs.

The essential factors for the determination of NEC paygrades are listed and discussed.

A Study of the Rating Structure Requirements for the Aviation 3M Data Analyst. SRR 70-6. August 1969. Joseph R. Heinzel and R. V. May, Jr.

The purpose of this research was to determine the optimum means of identifying personnel qualified to perform Aviation 3M Data Analysis. Resolution of this objective involved the identification of numerous problem areas contributing to the instability of the Data Analysis work force and the scarcity of personnel in that work force.

The approach involved technical conferences and discussions with Maintenance Officers and Aviation 3M Data Analysis Officers as well as a number of occupational analysis interviews with enlisted personnel assigned to Aviation 3M Data Analysis billets at 33 East and West Coast commands, staffs, and offices. Based upon these preliminary visits, two questionnaires were developed. The first was a Command Questionnaire designed to elicit information regarding problems experienced by the command. Of 82 commands included in the sample, 94% returned completed questionnaires. The second questionnaire was an Individual Questionnaire administered only to qualified Aviation 3M Data Analysts and was designed to obtain information concerning the type of work performed, nature of school background, and similar information. One hundred and thirty-two completed Individual Questionnaires were received.

Conclusions reached indicated that the Aviation 3M Data Analysis function is closely allied to the Aviation Maintenance Administrationman (AZ) rating and that input into the Aviation 3M Data Analysis field should be from the AZ rating. It was recommended that a service rating of the AZ rating be established at the E-6 level and extend through the E-9 level.

Proposed Procedures for the Development of Ship Manning Documents. WRR 70-1. September 1969. 156 pp. (UNCLASSIFIED). A. W. Bright, K. E. Witham, D. A. Wedding and W. R. Bell.

This research report describes the rationale, approach, and methodology developed for the determination and documentation of enlisted manpower requirements for various classes of Navy ships.

Appendix A to the report is a draft of a proposed Manual for the Development of Ship Manning Documents for issuance as an official OPNAV Publication.

The procedures described establish the minimum qualitative/quantitative enlisted manpower required of a fully combat ready ship. These requirements are presented in a format which facilitates changes to official manpower authorization documents and permits a detailed review of requirements by personnel in DOD, BUBUD, etc.

A Study of the Use of Historical Data in Naval Officer Personnel Management. SRR 70-15. December 1969. John S. Malone and Robert P. Thorpe.

The general purpose of the research described in this report concerns the development of a computerized officer historical data bank capable of supporting the officer personnel management functions of the Bureau of Naval Personnel (BUPERS). Specifically, the research was focused on the feasibility of utilizing officer historical data files already available in the BUPERS management information system as the beginning data base for the development of the operational historical data bank.

The research approach was directed at (1) the determination of user requirements for historical data in BUPERS, (2) the collection of historical data available in the Naval Manpower Information System (NMIS), and (3) the analysis of these data in terms of their relationship to the identified user requirements. The analysis focused on the contents of the files, the stability of certain key data elements, and the problems that might be encountered in the retrieval and display of the data for a typical user application.

Based on the findings of the analysis and related studies it was recommended that (1) a concerted effort be made by all users to define the exact specifications for an operational officer historical data bank; (2) the available historical data files should be considered as the fundamental data base in the development of the operational data bank; (3) the responsibility for the development of the data bank should be one of the many efforts under the cognizance of the Assistant Chief for Management Information (Pers-N) directed at the improvement of the overall BUPERS information system; and (4) the research efforts of this Laboratory be directed, as necessary, at improving the utilization of historical data rather than at the solution of problems associated with the development and implementation of the data bank itself.

Research Report on Revising the AW Rating Path of Advancement to Warrant Officer and Limited Duty Officer. SRR 70-21. February 1970. Joseph R. Heinzel.

The purpose of this research was to evaluate the present path of advancement of the Antisubmarine Warfare Technician (AW) rating to Warrant Officer (WO) and Limited Duty Officer (LDO) categories and make recommendations for changes if found necessary. The present path of advancement leads to WO 761 (Aviation Electronics Technician) and LDO 680 (Avionics).

The approach used as primarily the survey method which included the use of structured interviews and discussions with key officers and senior enlisted personnel in 36 representative operating commands and staffs concerned with Antisubmarine Warfare (ASW) and the administration of specially designed Command Questionnaire to 25 commands in this sample.

The analysis and evaluation of the data collected led to the recommendation that new WO and LDO categories should be established with the title of "ASW Sensor Operator". Several other recommendations were made concerning various administrative actions which should be taken to ensure that the ASW capability of the Navy is benefited to the maximum degree by the establishment of new WO and LDO categories.

Design of an Optimum Navy Enlisted Classification Structure: Feasibility of Identifying Levels of Proficiency in NECs. WRM 70-32. March 1970. N. A. Hrutkay and G. L. Lane.

This report presents an analysis of research findings in regard to the feasibility of identifying levels of proficiency in NECs. Included are comments concerning problems encountered in using NECs in their present format for determining levels of proficiency.

Included also is a description of the salient features of the Classification Systems of the U. S. Army and U. S. Air Force, and the various elements and factors involved in proficiency (skill) level determination.

The Navy Rating Structure and the Self Renewing Occupational Field (SROF) Concept: An Analysis. WRM 70-26. March 1970. 213 pp. H. Linsert and G. L. Lane.

This Research Memorandum analyzes the Navy rating structure in relation to the Department of Defense Self Renewing Occupational Field (SROF) concept.

A Study of the ADJ/ADR Rating Structure and the USMC MOS's 6331/6311. SRR 70-22. March 1970. Joseph R. Heinzel and R. V. May, Jr.

The purpose of this research was to validate and/or support revision to the aviation Machinist's Mate rating structure. Currently, there are two service ratings, ADJ for personnel who maintain jet aircraft engines and ADR for personnel who maintain reciprocating aircraft engines. Reciprocating engines are being phased down in the Navy Inventory faster than reduction in the engine maintenance work force.

The approach involved technical conferences and discussions with maintenance officers and staff officers at a number of East and West Coast and Washington, D. C. commands, staffs, and offices. In addition, occupational analysis interviews were conducted with enlisted personnel assigned to aircraft engine maintenance billets. Based upon information obtained, a command questionnaire was developed to elicit information regarding problems associated with the present rating structure and any effects which either positive or negative changes would cause. Ninety-four operating squadrons and Air Stations were contacted with a 79.8% response.

Conclusions reached indicated that training for first enlistement personnel should be limited to jet or reciprocating engine maintenance. There is some mal-utilization of senior ADJ and ADR personnel in commands in which both types of engines are maintained. Further, the cross-training of E-6 and E-7 AD personnel is not extensive because approximately half of the ADJ personnel have been trained in reciprocating engines while one-third of the ADR personnel have been trained in jet powerplant maintenance.

The major recommendation was that the ADJ and ADR service ratings be retained through pay grade E-5 and then merged into the general rating of AD at the E-6 level.

Navy Enlisted Classifications for Automated Propulsion Control Systems. WOS 71-2. August 1970. 18 pp. C. A. Gabrielsen and B. T. Litton.

The need for identifying enlisted personnel qualified to operate and maintain automated propulsion systems and for identifying the billets requiring such personnel is discussed. NEC codes are recommended and the qualifications required for such codes are defined.

Navy Officer Personnel System: Refinement of the Navy Officer Classification System. WRM 71-12. August 1970. 66 pp. J. M. Pugh.

Imperfections and faults have become increasingly apparent in the Navy's system of officer classification due to changes in the budget process under the planning and programming system and the demand for computer assisted personnel management capabilities. Current and historical information concerning Navy officer classification, particularly the officer "designator", has been reviewed and given preliminary analysis in relation to the entire officer personnel system requirements. Recommendations are made for refinements to the officer classification system which incorporate basic concepts with specific developmental research and development tasks for Fiscal Year 1971.

Design of an Optimum Navy Enlisted Classification Structure: Analysis of the Requirement for the Communications Yeoman (CYN) Service Rating. WRM 71-19. October 1970. 38 pp. G. L. Lane and N. A. Hrutkay.

The validity of the requirement for the CYN service rating under current conditions is analyzed. Investigation includes reasons for implementation of the service rating; comparison of CYN, RM and YN Class "A" Schools curricula; advancement and utilization of CYNs; and changes which have occurred in naval communications procedures and rating responsibilities having an effect on the requirement for the CYN service rating. Findings are derived from review of pertinent literature, interviews with cognizant management, training and operating personnel (officer, enlisted and civilian), and observations at afloat and ashore communications activities. In concluding that the CYN rating should be disestablished, andlysis is made of the impact on currently designated CYNs, the impact on the billet structure of the RM and YN ratings, changes in training required, and costs involved. Recommended procedures are provided for disestablishment of the service rating and disposition of CYNs.

Development of Shore Manning Documents (SHMDs) Using the Operational Audit Measurement Method. WRR 71-4. November 1970. 245 pp.
A. Byspiel.

This report documents the development of Shore Manning Documents (SHMDs), a new concept in determining and documenting Navy manpower requirements (military and civilian) for shore activities. The requirements for better manpower determination tools, Navy guidance, and related manpower systems are given. The reasons for the selection of the operational audit measurement method as the primary means of determining naval manpower requirements are provided, along with a discussion of Navy-wide related data systems, development of a SHMD format and specially designed measurement study forms. The four phases of developing an SHMD are explained; these are the preliminary, measurement, SHMD development, and SHMD review and promulgation phases. There are also two follow-on phases: criteria development and model development which are also discussed. These last two phases enable Shore Manning Documents to become dynamic tools for determining naval manpower ashore. Research is continuing in the model development area.

The Enlisted Grade Projection Model (PROMOD): A Management Tool for Navy Personnel Planners. WRM 71-24. December 1970. 104 pp.
K. B. Gladstone and PN3 D. Swerdlow, USNR.

A Navy Enlisted aggregate personnel projection model has been developed to analyze various relationships of changes in force structure to changes in personnel inventory. This model examines a variety of personnel policies and changes in force structure variables. It is specifically designed to test the future ramifications of short-term personnel policies and portray the trade-off between short and long term policy objectives. Statistical extrapolation, econometric, and mathematical logic have been accomplished on such variables as loss rates and promotion rates to provide a more exact specification of the model in addition to a better prediction capability.

Navy Enlisted Classification for Administrative Assistant to Naval Control of Shipping Officer (NCSO). WOS 71-3. January 1971. 18 pp.
B. T. Litton and W. G. Leischner.

The need for identifying enlisted personnel experienced in the administrative procedures required for assisting a Naval Control of Shipping Officer and for identifying the billets requiring such personnel is discussed. It is concluded that the duties involved are common to the ratings involved and do not meet the criteria for establishment of a Navy Enlisted Classification Code. It is recommended that enlisted naval reservists be included in the Navy Reserve Training Program as a means of having trained personnel available to meet mobilization requirements.

The Storekeeper Rating: New Concepts to Improve Training Assignment, Performance, and Utilization. WRM 71-37. April 1971. 95 pp.
D. H. Sass.

Storekeeper personnel skill and knowledge requirements are discussed in terms of training, identification, and utilization. Manual skills which predominate in the material handling functions of supply (storerooms and warehouses) are contrasted to the clerical skills which predominate in the administrative functions (inventory and financial control). Supply activities equipped with computers employ techniques unique to automation and impose specific skill and knowledge requirements on Storekeepers. These requirements are compared to those utilized by Storekeepers assigned to non-mechanized (manual) supply systems.

Recommendations are made to assist Navy planners in classifying, identifying, training, utilizing and managing personnel in the Storekeeper rating.

New Concepts in Enlisted Personnel Planning: Introduction to the ADSTAP System. SRR 71-28. May 1971. Joe Silverman.

Requirements for naval personnel, both as to number and type of skill, are undergoing continual change. In addition, the personnel resources necessary to meet these requirements are similarly dynamic in nature, constantly changing in their availability and configuration. This situation places enormous demands on the naval personnel management system in planning the development, maintenance, and utilization of personnel inventories compatible with manpower requirements. The increasing criticality of this situation has intensified the Navy's effort to provide the personnel manager with advanced, computer-based methods to assist in planning and controlling personnel resources. Fundamentally, the purpose of this research is to investigate advances in computer technology and management science for possible application in the development of complex, large-scale, personnel planning decision systems. Such a System, termed ADSTAP (Advancement, Strength, and Training Plans), has been developed in terms of a tripartite structure. A planning data base is extracted from current and historical personnel accounting records and becomes input for a force structure Projection Model. The Model simulates the naval enlisted personnel system and produces output which constrains a wide range of planning programs and models concerned with strength levels, manpower budget, promotions, training, and other personnel functions. A prototype of the ADSTAP System is currently undergoing test and evaluation in the Bureau of Naval Personnel.

Simulation Technology: Model Input Processing Technique. WRM 71-33. May 1971. 67 pp. K. B. Rhodes.

This study was accomplished in four phases: (1) identification of input data requirements for the Total Ship Simulation Model (SHIP II), (2) analysis of processing requirements for the input data set, (3) programming of automated processing routines, and (4) test and evaluation of the programs,

In the first phase, a data element catalogue format was developed, and utilized to provide a catalogue of input data for SHIP II.

In the second phase, the input processing requirements were identified. A set of processes to be automated was determined, based on considerations of feasbility and utility. During the third phase, computer programs were written, following a general programming procedure that was developed for programs of this type. Finally, the programs were tested and evaluated for effectiveness and efficiency. The programs were found to be responsive to the requirements and economical in their operation.

Navy Enlisted Classification Paygrade Ranges: A New Concept. WRM 71-51. June 1971. 183 pp. J. N. Clary.

This report presents the factors to be considered in NEC paygrading decisions. The establishment of minimum and maximum paygrades for NECs is a new concept in the administration of the NEC System which provides needed constraints on the acquisition and retention of NECs, especially by senior petty officers.

Included in this report are recommended paygrade ranges for currently established NECs and an evaluation of the effects of the paygrading decisions in the NEC inventory.

Navy Officer Personnel System - Refinement of Officer Billet and Experience Classification Coding. WRM 71-49. June 1971. 40 pp. N. A. Hrutkay, J. M. Pugh and G. L. Lane.

The Navy Officer Billet Classification Code Structure (NOBC) is not entirely satisfactory for identification of officer billet functional requirements and officer functional experience qualifications. This report describes a proposed technique for the design of NOBC functional hierarchies to more effectively identify billet requirements and experience qualifications.

Simulation Technology: Model Output Processing Technique. WRM 71-53. June 1971. 21 pp. K. B. Rhodes.

This study was accomplished in three phases: (1) Identification and investigation of possible procedures for handling simulation model output data and selection of an optimum set of procedures; (2) identification of applicable data analysis procedures and selection of a set to be programmed under the current study; (3) programming and testing of computer routines for the procedures selected in (1) and (2).

Manual, partly automated and fully automated data handling were evaluated. A fully automated procedure was developed whereby the simulation model outputs could be extracted, formatted, and stored for later rapid access by the computer. A large population of data analysis procedures was surveyed for potential applicability to simulation research problems. Classes of analysis techniques were identified, and specific procedures were selected for each class on the basis of utility and efficiency. Finally, computer routines were written and tested to automate the procedure developed in phase one and a subset of the analyses selected in phase two. The automated data storage, extraction, and analysis process was found to be feasible, and a possible source of considerable savings in both time and resources.

Navy Officer Personnel System - Development of the Navy Officer Designation Structures. WRM 71-40. May 1971. 54 pp. G. L. Lane and J. M. Pugh.

The current Navy Officer Designation Classification Coding Structure (Designator) has not met all the manpower management and personnel administrative needs of the Navy. This report describes the development of an Additional Qualification Designation (AQD) structure which will supplement the designator and be applicable to both requirements and resources. Recommendations include modifications of the designators, a proposed AQD structure for the unrestricted line (less aviation), and necessary research to complete refinement of the Navy Officer Classification System.

Research Report on New Concepts of Aviation Apprenticeship Qualifications. SRR 72-7. August 1971. Joseph R. Heinzel.

Current Airman qualifications are applied equally to all Group IX (Aviation) ratings although they are actually fleet/squadron oriented and do not reflect realistic professional requirements applicable as an apprenticeship to all work areas in the aviation rating structure. In recognition of this fact, the Chief of Naval Operations (OP-553) requested the Chief of Naval Personnel (Pers-A3) to initiate research to review current AN qualifications to determine the desirability and practicability of developing "common core" qualifications supplemented by rating-oriented items. Data initially gathered and analyzed indicated it was neither feasible to group AN qualifications into the aircraft maintenance, operational, and clerical areas nor to develop AN advancement qualifications which would be class "A" service school oriented. The research approach was therefore revised to provide for the development of new AN advancement qualifications encompassing general aviation knowledge factors only.

The principal conclusions and recommendations of this research are as follows: Utilization of aviation A-school trainees is initially ineffective at their first permanent command because few are utilized in the duties in which they were trained and because of the time lag between receipt of A-school training and assignment to a shop or work center. Consideration should therefore be given to rescheduling the training cycle to provide more immediate effective utilization of apprentice personnel upon completion of A-school. The current qualifications for Airman are not indicative of the tasks and duties performed by most Airmen. Advancement to AN by examination is both inequitable and unnecessary. Therefore, advancement qualifications for Airmen should be eliminated as well as the current written examination for AN and such advancement be based solely upon the commanding officer's recommendation.

Reactions of Stewards and Commissarymen Toward a Proposed Consolidation of Their Ratings. WSR 72-1. August 1971. 260 pp. T. W. Muldrow and LT T. Shaw, USN.

This report reveals the results of a study conducted to assess the attitudes, opinions and experiences of those men in the food service occupational field (SDs and CSs) regarding their views toward a proposed consolidation of their two ratings.

Questionnaires were mailed directly to the active duty Navy population of stewards and commissarymen. Responses were received from 3,465 stewards and 4,254 commissarymen in time to be included in this report.

Stewards are the most career motivated and the most satisfied with Navy life in general. Commissarymen are the most satisfied with their present rating.

Eight in ten of the CSs are opposed to a combining of the CS and SD ratings; while the greatest proportion of SDs were either in favor of a merger (39%) or were neutral toward the idea (35%). The majority of the stewards who are both favorable toward or neutral about consolidation reported a preference to perform those duties involving the preparation and serving of food and maintenance of messing facilities for officer and/or enlisted personnel. The majority of the commissarymen indicated a willingness to perform these above mentioned duties for enlisted personnel only. The majority of the SDs and CSs do not believe they would have a great deal of difficulty performing the duties of each other's rating. Fifty-eight percent of the SDs believe consolidation would be advantageous to their advancement opportunities: 79% of the CSs believe that a merger would be disadvantageous to their advancement opportunities. Except for the actual serving of food, the majority of the stewards and commissarymen indicated the tasks they are required to perform are similar to each others.

Occupational Analysis: Report on Data Collection Phase of Navy-wide Field Test of Boatswain's Mate Rating. WRM 72-11. September 1971. 110 pp. C. T. Marshall and PNC S. A. Shaw, USN.

A field test of a data gathering instrument, which was designed to collect occupational information from billet incumbents through the use of a mailed Rating Billet Inventory (RBI), is described.

Collected data are processed and stored on magnetic tape. Computer programs are utilized to analyze collected data and provide printouts to serve as a basis for making decisions in various areas of personnel administration, such as manpower authorizations, training, advancement, assignment, and job evaluation.

The boatswain's mate rating was selected for the field test because the duties of the rating are required on nearly every ship type and class in the Navy.

The Questionnaire as a Manpower Planning Tool. WRR 72-6. November 1971. 486 pp. E. S. Hutchins.

The use of a questionnaire as a means of validating and forecasting manpower requirements as a function of workload at a naval shore activity down to and including the billet level of detail is covered in this report. An examination of the activity organization and functional structure is performed. Manpower requirements by rate, rating, grade, skill, level, special qualification (NEC, NOBC, civilian specialty) are determined. Findings indicated that it is feasible to forecast manpower requirements as a function of workload utilizing a questionnaire approach.

MANPOWER MANAGEMENT

Occupational Analysis: Report on Analysis of Boatswain's Mate Data Collected During Navy-Wide Field Test of an Occupational Analysis System. WRM 72-22, February 1972. C. T. Marshall. DDC Availability No. AD 738 440.

An analysis of boatswain's mate rating occupational information collected during a Navy-wide field test of an occupational analysis is presented. The boatswain's mate rating was selected for the field test because the duties of the rating are required on nearly every ship and class in the Navy.

Occupational information was collected by mail from both the Atlantic and Pacific fleets. A total of 203 ships and one mine squadron responded to the survey and provided data pertaining to 1,315 individual billets.

The Ship's Serviceman Rating: New Concepts to Improve Training, Assignment, Performance and Utilization. WRM 72-23, March 1972. D. H. Sass & D. Swerdlow, PN2, USN. DDC Availability No. AD 740 810.

Skill and knowledge requirements for the ship's servicemen are discussed in terms of billets, training, identification, and utilization. Advancement opportunity, retention and rating structure are also considered. Evaluation of the rating is in terms of its primary responsibility to provide services and conveniences, mainly to the afloat forces.

The responsibilities of the rating require the performance of a variety of non-related jobs, ranging from manual labor to administration, which require varying degrees of physical dexterity and mental ability. Significant factors adversely affecting performance include inadequate numbers of rated personnel, high percentage of personnel in the lower mental groups, deficiencies in training, and lack of skill identification. The foregoing, in turn, affect personnel utilization, personnel development, advancement and retention.

Recommendations are made to assist Navy planners in developing procedures for training, identifying, utilizing, and managing personnel in the ship's serviceman rating.

Prolegomena to Recruit Input Planning. SRM 72-11, April 1972. Raymond E. Willis, Duane D. Kirkland and Joe Silverman.

A prototype computer model has been developed that will calculate the "optimal" number of recruits to be allocated to a given naval service rating for each of a set of time periods. The primary goal of this model is to allocate sufficient recruits to a rating in order to meet the future petty officer needs of that rating. For a variety of reasons, this demand for petty officers is subject to fluctuation over time. The problem of meeting the changing demand is complicated by limitations in training plant capacity, budgetary controls, and other constraints on the number of recruits that can be input in any given time period. Furthermore, the length of time that it takes for a recruit to advance to petty officer status is also of consideration and subject to constraint.

In order to find an optimal allocation, the model must reconcile this conflicting set of goals. For each of these goals, the number of recruits that will best meet that goal is calculated for each time period. Cost is then defined as a function of the deviation from each of these desired allocations. The optimal allocation is defined as that set of recruit inputs over time that will minimize this cost function.

Work Requirements Information to Improve Training and Shipboard Manpower Utilization in the Engineering and Hull Ratings. May 1972. H. C. McDowell, J. G. Balaban, M. H. Covher and DP1 C. L. Matthiesen. With Supplement I of June 1972.

SRM 72-13 - Electrician's Mate (EM) Rating
SRM 72-14 - Boilermaker (BR) Rating
SRM 72-15 - Boiler Technician (BT) Rating
SRM 72-16 - Engineman (EN) Rating
SRM 72-17 - Hull Maintenance Technician (HT) Rating
SRM 72-18 - Interior Communications Electrician (IC) Rating
SRM 72-19 - Machinery Repairman (MR) Rating
SRM 72-20 - Machinist's Mate (MM) Rating
SRM 72-21 - Molder (ML) Rating
SRM 72-22 - Patternmaker (PM) Rating

These Research Memoranda consist of computer printout data by pay grade divided into the three following categories: (1) task data, (2) special equipment, tools and publications, and (3) miscellaneous data.

Task data include for each task the percentage and number of personnel by pay grade responding to such factors as how often task is performed, how task was learned, and participation status.

Special equipment, tools and publications data include the percentage and number of personnel by pay grade responding to whether they used, operated, or maintained special equipment, tools, and equipment.

Miscellaneous data include, for each pay grade, physical hazards, worker characteristics, watch standing duties, and job satisfaction of the job.

Supplement I involves only the task portion of this research effort, identifying overall task importance, suitability of task item for Class "A" School curricula and cluster pattern or grouping of responses.

A Model for Measuring Productivity Trends at Naval Shore Activities.
WRR 72-9, June 1972. J. E. Zamarra and L. A. Brousseau.

The report describes a methodology for measuring manpower productivity at naval shore stations. Productivity is broadly defined as the ratio of output per unit over time. The necessary equations are described along with definitions of the basic terminology. A unique feature of the methodology is that productivity indices may be computed without the usual necessity of placing a dollar value on output. Physical quantities of dissimilar outputs may be aggregated from any level of detail desired using the weighting procedure outlined.

To demonstrate its utility, the model was applied to a naval shore station. Output and input data for a specified range of final outputs form the basis for the productivity index computations. A computer model was designed and utilized to facilitate the computations. To illustrate how the aggregation feature of the model operates, one department of the station was divided into twenty-two separate entities or work centers. Productivity indices were computed for each work center and then an aggregate index was obtained for the department. This measure was combined with indices from the eight other departments at the station to form a composite productivity index for the station as a whole.

Navy Officer Personnel System - Improved Identification of Officer Billets and Experience. WRM 72-28, June 1972. J. M. Pugh and G. L. Lane. DDC Availability No. AD 744 622.

The Navy Officer Billet Classification (NOBC) code structure has not been entirely satisfactory for identification of officer billet functional requirements and officer functional experience qualifications. This report describes and recommends refinement to the NOBC structure that will meet the needs of officer requirements and resource managers. Included in the report are a proposed restructure of the total NOBC structure based upon the concept of grouping by functional hierarchies, a description of the methodology for deriving functional groupings, and various examples of application to functional groups, such as command, management, shipboard operations, etc.

New Concepts to Improve Training and Shipboard Manpower Utilization in the Engineering and Hull Ratings: Statistical Analysis. SRR 72-26, June 1972. Huiett C. McDowell and Gordon S. Hulegaard.

A considerable amount of research has been conducted concerning job analysis methodology. Insufficient information is available, however, as to how job analysis techniques can best be utilized for such as common course development, curriculum planning, rating restructuring, qualifications for advancement development, job satisfaction, billet restructuring, and distribution and assignment. The Chief of Naval Personnel

(Pers-A3), aware that the most effective method of solving these problems is to identify actual work being performed, directed this Laboratory to proceed in determining research methodology and actual work requirements for the Engineering and Hull ratings. Research tools and techniques for data gathering were developed, tested and revised.

Data were collected, analyzed, and displayed as computer printouts. These printouts were published, one for each of the ten ratings, as SRM 72-13 through SRM 72-22. Task commonality is being published as SRM 72-26. This research report primarily describes statistical methodology used in these research memoranda including research tool and technique design, sample and population size, ship types and numbers, data gathering methodology and statistical cues indicating task items suitable for Class "A" School curriculum, overall task importance, and tasks common to two or more of the ten ratings.

Occupational Analysis: Report on Data Collection of Navy-Wide Test of Group IX Ratings. WRM 72-35, June 1972. M. D. Cullison.

Data gathering techniques and data gathering instruments were tested in the Aerographer's Mate (AG) and Air Controlman (AC) ratings to determine their feasibility in the building of a Navy enlisted occupational data bank. A twenty page response packet was developed to accommodate responses to a questionnaire concerning specific task statements, items of equipment, watches, types of aircraft, and worker characteristics.

Three methods of questionnaire administration and participation by billet incumbent revealed most desirable and least desirable methods. Optical scanning of raw case data, development of computer interface programs, and computer processing methods are described. Examples of computer printouts, with accompanying abstracts in table form, were presented to demonstrate the types of information available for consumer study.

Computerized Occupational Data Analysis Program (CODAP/370) is described and its usage for providing occupational data for analysis is stressed. Recommendations for uses of occupational data by managers and planners are discussed. Location of "problem" areas by use of the computer printouts is shown by comparative studies in NECs and work areas. Equipment usage is presented in tabular form and shows the relationship by numbers of personnel operating, repairing, or performing both functions.

Research Report on Enlisted Aircrewmen Management Concepts. SRR 72-25, June 1972. LCDR Harold C. Treptow.

The purpose of this research was to evaluate the aircrewmen program and make recommendations regarding management concepts and the feasibility/desirability of establishing a rating for nonASW aircrewmen.

The approach used was primarily the survey method which included interviews and discussions with key officers and enlisted aircrewmen in operating units and shore commands utilizing the various categories of aircrew specialties, and the administration of specially designed questionnaires for commands and aircrewmen.

The analysis and evaluation of the data collected led to the conclusion that a rating, or ratings, for nonASW aircrewmen is not feasible/desirable. It was further concluded that administrative changes which the aircrewmen program had undergone since the inception of this research had resulted in the evolution of an essentially new management system.

The Development of Computerized Techniques for Enlisted Advancement Planning. SRR 73-1, July 1972. Tandy B. Quisenberry.

The purpose of the Navy's enlisted advancement system is to ensure qualified personnel are promoted to fill petty officer vacancies while at the same time providing ample career promotion opportunities. Advancement flows must be precisely geared to filling vacancies in the top six pay grades of some 100 occupational specialties under conditions of changing manpower resources and requirements. This task becomes particularly difficult when constrained by policies relating to budgetary controls, quality control, and operational readiness. Effective management of the advancement planning function within these constraints has been hampered in the past due to limited availability of data and management tools. Because of the large number of data manipulations, and the tradeoffs required, enlisted advancement planning was considered to be a prime candidate for the application of computer technology. Commencing with a simple prototype that replicated existing manual planning methods, various techniques and concepts were evaluated under actual operational conditions. The resulting set of programs for computerized enlisted advancement planning are designed to provide a broad data base for operational as well as high level policy decisions relative to planning and controlling the force of petty officers. Advancement planning models have been used as the primary tools in determining numbers of petty officer advancements to authorize and to permit the testing of alternative advancement and other personnel policies.

Occupational Analysis: Report of Analysis of Data from Field Test of Aerographer's Mate Rating. WTR 73-1, July 1972. M. D. Cullison. DDC Availability No. AD 747 643.

Investigation includes study of the Aerographer's Mate (AG) rating with particular reference to five areas of interest: (a) Background Information, (b) Analysis of Comparisons of Tasks Performed by Different Groups, (c) Statistics Showing Use of Equipment, (d) Tasks Performed Compared to Practical Factors, and (e) Participation by Female Personnel in the Navy.

Tasks are compared for personnel holding NEC and personnel without NEC. AGs occupying computer coded billets are compared with other sample groups. ASWEPS tasks are examined and comparisons of groups performing those tasks are made. Forecasting tasks are studied to determine the amount of participation by AGs with NECs, AGs in coded billets, and all other AGs.

AGs in special assignments, such as hurricane hunting, intelligence communities, security group assignments, etc., tend to lose proficiency and expertise in rating.

A complete review was conducted to present the use and repair of equipment in the rating. Significant percentages were presented in certain items of equipment. A review of the need for continuation of the AROWAGRAM was conducted with positive results.

A Review and Assessment of the Ship II Simulation Model. WTR 73-4, July 1972. M. A. Schwartz. DDC Availability No. AD 748 595.

It was the purpose of this study to review all prior research application of SHIP II, a large scale computer simulation model of a total ship which can be used in manpower studies, and then to evaluate the technical adequacy and financial feasibility of using the model.

The approach to the study included review of research documentation, evaluation of each previous study, and synthesis of result. It was concluded that the SHIP II model has adequately met criteria of face validity, reliability, and others, and is a useful tool for manpower research.

Bibliography for the Navy Technological Projections Part II 5B: Personnel Technology. SRR 73-4, August 1972.

The purpose of the Navy Technological Projections (NTP) Part II as stated in NAVMATINST 3910.10B of 18 December 1970 is "... to present scientific and technological projections within a 20 year period," to "...identify probable advancements or limitations on advancements in technology," and to "...provide ideas in interrelated fields of technology as building blocks to assist the decision-maker in planning his long-range programs for developing future operational systems." Five functional areas are designated as the subjects of NTP to be prepared by designated Navy Laboratories: (1) Intelligence and Surveillance Technologies; (2) Command, Control. Communications Technologies; (3) Weapons and Countermeasures Technologics; (4) Mobility Technologies; and (5) Support Technologies. Within Support Technologies are included several sub areas one of which, Personnel Technology is divided into 5B: Personnel and 5C: Training Devices. The Naval Personnel and Training Research Laboratory is the Responsible Coordinating Activity for 5B: Personnel. The projection was submitted under memo of 31 May 1972 (see Appendix A). Because space was so limited, references were not included and are the subject of the present publication.

The following projections are included within 5B: Personnel Technology:

5B	001	Personnel Systems Engineering
5B	002	Computer Technology in Personnel Management
5B	003	Computer Applications to Training and Training Management
5B	004	Individualized Instruction in Navy Training
5B	005	Instructional Design
5B	006	Training Evaluation
5B	007	Training Utilization of Television
5B	008	Job Performance Aids
5B	009	Behavior Management
5B	010	Manpower/Personnel Costs
5B	011	Task Inventory, Description, and Analysis
5B	012	Navy Occupational Analysis

The Manpower Control System (USMC): An Analysis of Enlisted Force Management. WTR 73-6, August 1972. K. M. Gladstone. DDC Availability No. AD 755 170.

This research is designed to assist Marine Corps efforts to develop a suitable system for optimally coordinating its network of operational manpower control actions. Such a system is essential to maximize manpower planning and policy development. Specifically, this research is aimed at improving visibility and coordination of the existing enlisted force management subsystem. It focuses on the interrelationships among the subsystem's diverse elements. This will enhance operational effectiveness by insuring that necessary stabilizing actions are taken when a major variable of the subsystem

Occupational Analysis: Interim Report on the Design of a Navy Officer Occupational Analysis System. WTR 73-9, January 1973. G. L. Lane and C. T. Marshall. DDC Availability No. AD 754 178.

This report describes the preliminary design and development of the Navy officer occupational analysis system. Differences of techniques from those in current use for Navy enlisted occupational analysis are discussed. The methodology used for collection of occupational data, design and development of the task inventory, and administration of the task inventory is described. The pilot-test inventory (Combat Information Center Officer) is included as an appendix.

Computer Models for Manpower and Personnel Management: State of Current Technology (With Emphasis on Navy Operational Models). WTR 73-25, April 1973. E. S. Hutchins, et al.

Within the selected field of manpower and personnel management, over 230 computer models are reported and a significant number are exposed to an examination of their techniques and areas of application. In addition, 102 related studies and programs are identified. A strategy for performing a technical evaluation is developed and reported, and a functional taxonomy of computer models in this selected discipline designed and applied. A review of the questionnaire technique employed in the data acquisition phase of the project, with appropriate recommendations for improvements, is also included. The analysis of acquired model data within the taxonomy framework provides both quality and quantity appraisals with respect to application areas covered and techniques employed. An expanded glossary of selected modeling terms and a bibliography of considerable size which resulted from this research effort should prove most beneficial to interested model developers and users. Guidelines for future, needed endeavors are also presented. A by-product of this research is the sizable Compendium of Models and Related Manpower/Personnel Programs and Studies (listed as Appendix "A" and published under separate cover as WTR 73-25A).

is manipulated. With such information, the headquarters action officer concerned with force management may then select that combination of measures best suited to achieve his particular manpower objective, secure in the knowledge that his actions will not destabilize the subsystem. A comprehensive examination of the headquarters organizational structure, combined with a series of personal interviews with key military and civilian staff members, has enabled the definition of de facto staff organizational relationships. The results provide useful insight into the actual and relative strengths of both assigned and assumed responsibilities for different actions within the existing manpower control system in general and the enlisted force management subsystem in particular.

New Electronic Career Concepts, Interim Report. WRM 72-13, October 1972.
J. I. Bershtein and R. H. Gaylord. DDC Availability No. AD 888 534L.

The objective of this research was to determine the optimum electronic rating structure (less the aviation (Group IX) ratings) needed for effective operation and maintenance of combat ships' electronic/weapon systems of the Navy of 1975 and beyond. This research memorandum reports on the progress made during the past year of research.

The initial thrust of FY 71 research concerned fleet electronic maintenance requirements for the project's time frame. Analysis of the data obtained led to the development of a concept for an improved electronic maintenance rating structure that, it is felt, will satisfy fleet requirements of the project's time frame and will be flexible enough for adapting to changes in the extended future. The concept consists of at least three levels of training and expertise. Systems technicians specially trained to identify casualties and coordinate fault isolation and repair within a system composed of a large number of integrally combined subsystems; subsystem technicians specially trained to isolate casualties in specified subsystems and supervise repair specialists in correcting such casualties; and repair specialists who would be intensively trained within one of a number of narrow specialties to troubleshoot and correct circuit level malfunctions on a shipwide basis.

Computer Models for Manpower and Personnel Management: State of Current Technology (With Emphasis on Navy Operational Models) - Appendix "A" - Compendium of Models and Related Manpower/Personnel Programs and Studies.
WTR 73-25A, April 1973. E. S. Hutchins, et al.

This document is a supporting appendix to a NAVPERSRANDLAB research study which was conducted in response to the desires of the Deputy Chief of Naval Operations (Manpower) to ascertain the current state of computer modeling technology in the Navy, specifically, the area of manpower/personnel management planning and resources management. Computer model information acquired in the study was obtained through literature searches and a questionnaire process. Data were gathered on Navy, other services and selected models from industry and other government agencies. The acquired information has permitted the development of a very important by-product, "Compendium of Models and Related Manpower/Personnel Programs and Studies." The Compendium has immediate use and application for the research community as well as operating managers. Because of its size and uniqueness, the Compendium has been separately bound and tailored to stand alone. The level of detail obtained in the Compendium makes it the most complete systematic display of computer model information available in the selected field of manpower and personnel planning. Its uniqueness lies in its ability to display models within a basic model taxonomy framework (the model taxonomy concept employed is summarized in the Compendium and discussed at length in the research report), and the functional attributes of models are thus grouped to permit tracing of the logical flows between model classes.

Investigation of Non-Productive Time Allowances for Shipboard Personnel.
WTR 73-20, April 1973. H. L. Williams and U. Shvern.

The objective of this research study was to investigate the need for and feasibility of developing and applying more accurate allowances to account for the non-productive time associated with shipboard workloads. Findings of the study indicate that because of the dominance of watch station, NEC requirements and other constraints, the non-productive time allowance has only a minimal impact on billet requirements. It was concluded that primary emphasis needs to be given to the development of second generation improvements in the billet determination process rather than to improvements in the accuracy of the non-productive time allowances. Improvements in the allowance are recommended, however, as a means of better satisfying the needs of shipboard personnel.

Occupational Analysis: Application of Billet Evaluation Criteria to Naval Occupational Task Analysis Program Data. WTR 73-24, April 1973. C. T. Marshall. DDC Availability No. AD 760 308.

The billet evaluation system designed for Navy use is a modified version of the point rating factor comparison job evaluation method.

The incumbent is asked to respond to a set of questions which represent compensable factors. The average response of incumbents occupying billets at a given paygrade level represents the value of the factor as it pertains to the authorized paygrade of the billet. The sum of the factor averages then becomes a bench mark against which specific billets, existing or planned, can be compared.

The system was designed to operate within the Naval Occupational Task Analysis Program (NOTAP). As each rating is surveyed under NOTAP, a set of billet evaluation factors are developed and included in the survey instrument. It is not envisioned that a separate set of evaluation factors or a separate rating scale will be needed for each rating. As additional ratings are surveyed, evaluation factor compatibility will emerge.

Occupational information collected during a recent survey of the Aerographer's Mate is used in development of the system.

Occupational Analysis: Report of Analysis of Data from Field Test of Air Controlman Rating. WTR 73-16, April 1973. M. D. Cullison.

This investigation is a study of specific subject areas of the Air Controlman (AC) rating. Particular attention was devoted to such subjects as: (a) the commonality of NEC tasks, (b) utilization of equipment, (c) performance of women in the rating, and (d) training and curricula modification.

Tasks performed by different groups of ACs were compared to determine the areas of overlap and similarity. Conclusions were made that work performance of ACs was functionally oriented without specific regard to special training received or NECs awarded. "Core" training and specific "phase" training were recommended and intermediate and advanced type radar courses on a "modular" basis, as dictated by the needs of the fleet. More "personalization" and "individualization" were recommended for improving training curricula.

Updating of certain practical factors and the removal of practical factors representing NEC skills were recommended.

Full opportunity to perform all the tasks of the rating, including radar operation, otherwise elimination from the rating, was recommended for women in the rating.

Equipment lists contained many items common to different areas of work. Lists of common core equipment were recommended for air controller courses.

Analysis of the Impact of Reductions in Personnel Administration and Supply Support Workload Aboard Ship. WTR 73-36, June 1973. D. A. Wedding and R. E. Willis.

This study is designed to evaluate current shipboard Administrative/Support (A/S) manning concepts, identify and assess alternative concepts which eliminate redundancies, propose feasible automation and/or redirect non-mission required manpower demands to ashore activities. The Navy's current and past programs designed to improve A/S procedures were reviewed to build a "state-of-the-art" awareness as well as forming the basic data for the evaluation of current approaches to reduction of workload associated with these functions.

The purpose of this report is to summarize the results of efforts to identify areas of workload reduction, evaluate the impact of innovations on ship and shore activities and recommend feasible courses of action necessary to accomplish reductions in personnel administration and supply support functional manning requirements.

Evaluation of the SHIP II Total ~~Ship~~ Simulation Model. WTR 73-35, June 1973. R. N. Harris.

The purpose of this study was to review all prior research applications of SHIP II, which is a total ship manpower simulation model. An evaluation of SHIP II, based on 6 evaluation criteria, was then done. Recommendations of the quality of the model and its future use in Navy manpower planning were made.

The Navy Enlisted All-Digit Classification System: An Analysis. WTR 73-40, June 1973. G. L. Henry.

This report contains a brief history of the development of the Navy's currently used alpha-numeric enlisted classification system and a recapitulation of prior research directed toward design of an optimum enlisted classification structure. The occupational classification systems of the other U. S. military services, the DOD occupational groupings, and the Department of Labor's Dictionary of Occupational titles (DOT) classification system are analyzed with a view towards determining characteristics which might be adapted to a Navy all-digit enlisted classification system. Prerequisites for design of a classification system are presented. A tentative realignment of present occupational groupings and some examples of experimental classification systems are shown. The research failed to disclose any new system that would so significantly improve the Navy's capability to identify skills and requirements as to be worth the expenditure of money and manpower necessary to develop and implement a new system. Proposals are made regarding actions to be taken prior to expenditure of further effort on development of any new Navy enlisted classification system.

Naval Occupational Task Analysis Program Data Bank Information: Its Use in the Development/Updating of Qualifications for Advancement. WTR 73-32, June 1973. J. N. Clary.

The Naval Occupational Task Analysis Program (NOTAP) is concerned with the development of a multi-purpose occupational data bank. This study is concerned with the problem of analyzing data bank information and demonstrating the feasibility of using such information as a basis for developing and/or updating the Qualifications for Advancement of Navy enlisted personnel.

Methodologies for determining the validity of tasks for inclusion in the Qualifications for Advancement and for determining the paygrades for such tasks are included in the report.

The findings of this study are that it is feasible to utilize data bank information in the development and/or updating of Qualifications for Advancement and that the use of data bank information would preclude the necessity for separate rating surveys as are currently being conducted.

Occupational Analysis of the Aircrew Survival Equipmentman (PR) Rating. WTR 73-33, June 1973. L. A. Goldman.

This investigation is a study of specific subject areas of the Aircrew Survival Equipmentman (PR) rating. Attention was given to those functional task areas found to be inconsistent with the amount of training received in the PR Class "A" and PR Class "B" Schools. The PR NEC's utilization of equipment and an aspect of safety were also studied. Job satisfaction factors and worker characteristics were examined to provide a more in-depth view of this rating.

It was noted that the amount of parachute and oxygen systems training in the PR formal schools was substantially greater than the number of PR's in all paygrades performing such tasks. A possible realignment of the training in these schools was recommended.

It was observed that many PR's performed the duties pertaining to the two NEC's in this rating without holding these NEC's. It was recommended that all qualified PR's be properly identified.

Physical and mental characteristics, indicating the greatest and least degree of involvement, were determined. The sources of greatest and least job/military career satisfaction within this rating were also ascertained.

Unauthorized flight gear modifications per the direction of pilots were noted. Recommendations were made to alleviate this safety problem.

Occupational Analysis: Transition of the Naval Occupational Task Analysis Program (NOTAP) from Research to Operational Status - Evaluation of Program and Summation of Results. WTR 73-37, June 1973. C. T. Marshall.

The need exists to summarize exploratory and advanced development research leading to operational status of the Naval Occupational Task Analysis Program (NOTAP). Additionally, present and potential consumers of NOTAP data should be made aware of the program's future impact on naval personnel management.

Purpose of this investigation is to briefly review the military history of task analysis; provide a comprehensive review of exploratory and advanced development research leading to operational status of NOTAP, and alert potential consumers of NOTAP data as to its value.

Collection, processing, analysis, and application of NOTAP data are special subjects covered in detail. Task analysis methodology and application of techniques in the other military services and United States Coast Guard are summarized.

Operational Analysis: Final Report on the Design of a Navy Officer Occupational Analysis System. WTR 73-31, June 1973. G. L. Lane and C. T. Marshall.

This report summarizes exploratory development effort in the design and development of a Navy officer occupational analysis system. It describes the design and content of the Combat Information Center (CIC) Officer data gathering instrument (task inventory), administration procedures, and computer processing the data. Sample analyses of the derived data are presented as examples of military usefulness, and the methodology is critiqued. The CIC Officer task inventory and sample computer printouts are included as appendices.

Simulation for Manpower Reduction Afloat: A Trial Application. WTR 73-23, June 1973. K. B. Rhodes.

The purpose of the study was to determine the feasibility and demonstrate the heuristic method of application of the Ship II simulation model to manpower reduction of Navy ships. The approach was a three part, iterative method. The ship was simulated in its normal state; certain tasks were deleted (presumably to be performed ashore), and then certain billets were removed.

The study demonstrated that the method was effective for the problem, and also that the moving of the specified tasks ashore could result in significant manpower saving. The advantages of a heuristic model over a deterministic model were described.

First Progress Report on Research on Rotation of Technical Personnel. PRASD Report No. 214, July 1963. Richard D. Conner.

This is the first of a series of reports pertaining to research designed to study the personnel rotation system as it applies to the technical ratings and to make recommendations, as appropriate, for modifications which will improve stability and material readiness in the fleet. Subject report discusses the progress to data and future plans for each of the following four aspects of personnel rotation research: (1) personnel assignment within the fleet, (2) assignment policy for "short-timers," (3) shore assignments of technical personnel, and (4) establishing SEAVEY cut-off dates.

First Progress Report for Research on Forecasting Retention Rates of Personnel in Technical Ratings. PRASD Report No. 218, August 1963. Everett E. Johnston, Jr.

This is the first of a series of progress reports pertaining to research being conducted to develop retention rates for specific ratings. The research has two basic goals: (1) development of a method for predicting retention rates by specific ratings, and (2) determination of the changes that might have to be made in personnel policies and procedures in order to improve retention rates. This report presents a detailed discussion on the various types of variables on which information will be gathered and also lists the various types of Navy activities and government agencies which will be contacted.

A Proposal for Exploratory Research: Application of Utility Theory to Navy Personnel Decisions. PRASD Memorandum Report 63-14, August 1963. Ervin W. Curtis.

This paper argues that: (1) Subjective judgements and decisions which unavoidably depend on unstated and implicit values are far more common in personnel administration than are recognized. (2) The consequences of the above fact are far more important than is readily appreciated. (3) The gain to the Navy of placing these decisions on a more accurate and quantitative basis is potentially far greater than is generally realized. (4) Methods for placing the above mentioned judgements and decisions on a quantitative and systematic basis are much closer to practical application than is evident.

The paper describes several methods for measuring the differential utility of classification decisions. The methods are presented in terms of the assignment of recruits to Class "A" schools.

Conventional ways of classifying personnel, treating manpower shortages, and evaluating decision strategies (e.g., test cutoffs) are discussed from a decision-theoretic standpoint. Methodological research in this area is proposed.

Results of Survey to Identify Factors Affecting Reenlistment. PRASD Report No. 217, August 1963. Russell V. May, Jr.

This research report presents the results of a survey of 375 officers and enlisted men on the question of what actions the Navy should take to increase reenlistments. The three topics that received the highest frequency of comments were: (1) pay, (2) separation from family, and (3) the need for raising the quality standards for advancement. The three topics which ranked lowest were: (1) training, (2) reenlistment bonuses, and (3) workload. This report is a supplement to the research study on a proposed pay system to increase the retention of enlisted personnel, PRASD Report No. 211, May 1963.

The Prediction of Reenlistment Among Class "A" School Trained Men. PRASD Report No. 212, September 1963. (Later Issued as PRD TB 63-11.) John H. Steinemann.

Test and background data available from a large scale tryout of enlisted classification tests were analyzed to determine the relationship between such predictor information and the recruits' reenlistment decisions at the end of their first four-year term in service. The sample comprised about 14,000 graduates of Class "A" schools in 22 different ratings. Reenlistment was not found to be related to GCT scores or other available information.

Although none of the instruments evaluated in this study correlated substantially with the reenlistment criterion, a direct question on career-intention asked early in recruit training was found to be of potential value. The reenlistment rate for the group responding favorably to the career-intention question during recruit training was twice that for the group responding negatively (i.e., 27.6 percent as compared with 13.4 percent). For the one-half of the sample who responded "undecided," the reenlistment rate was 18.0 percent. It is therefore recommended that recruit statements on career-intention be given consideration in making school assignment, when selection must be made from among marginally-eligible recruits who are otherwise equally qualified for specialized training.

Comparison of Predictive and Concurrent Validities of Basic Test Battery Test Scores. PRASD Report No. 223, October 1963. (Later Issued as PRD TB 63-12) Edward F. Alf, Jr.

The General Classification Test, Arithmetic Test, Mechanical Test and Clerical Test of the Basic Test Battery, which are ordinarily administered to each recruit during his fourth day of recruit training, were experimentally readministered several months later to three samples of men immediately prior to their starting training in Electrician's Mate, Hospitalman, and Interior Communications Electrician's Class "A" schools. The purpose of the experiment was to determine if the test validities would be comparable for the two administrations, since a considerable economy could be effected in evaluating new tests if the validities were found to be comparable.

Since four tests were tried at each of three schools, there were twelve comparisons between the early (predictive) and later (concurrent) validity coefficients. In each case the concurrent validity coefficient was higher, the differences ranging from .01 to .09. It was concluded that in order for a test to be considered for possible use after a concurrent tryout, it must be at least .05 to .09 more valid than the operationally given (predictive) tests. Possible explanations for these findings are discussed.

Second Progress Report for Research on Forecasting Retention Rates of Personnel in Technical Ratings. PRASD Report No. 226, December 1963. Everett E. Johnston, Jr. and Joe Silverman.

This is the second of a series of progress reports pertaining to research being conducted to develop retention rates for specific ratings. Since the use of the concepts of "reenlistment" and "retention" was found not to be consistent within the Navy and Department of Defense, this report presents a detailed analyses of the differences regarding concepts, definitions, calculation procedures, etc., pertaining to reenlistment.

The Effects of the 1963 Military Pay Raise on the Career Intentions of Junior Naval Officers. PRASD Memorandum Report No. 64-1, January 1964. William H. Githens and Bernard Rimland.

Approximately 100 junior officers were interviewed to determine the effects of the 1963 pay raise on career intentions. It was concluded that the pay raise did not have a marked effect on the career motivations of the officers interviewed. Several other aspects of officer pay as related to career motivation are discussed.

The Construction and Standardization of a Short Pre-Classification Battery, Form SB-1. PRASD Report No. 229, February 1964. (Later Issued as PRD TB 64-3.) Lou Hicks Smith, Leonard Swanson, John H. Steinemann and Bernard Rimland.

This report describes the development of a short test battery for use at Recruiting Stations for pre-classification of enlistees. The tests are one-half the length of the parallel Basic Test Battery tests and provide the Recruiting Stations with useable approximations of the scores that applicants may be expected to achieve on the tests of the Basic Test Battery itself.

Validity of NROTC Selection Interviews against Career Decisions and Officer Fitness Reports: An Eight Year Follow-Up. PRASD Report No. 234, May 1964. William H. Githens and Bernard Rimland.

This report describes the validation of ratings of officer potential and of career motivation made during the 1955 selection interviews of applicants to the Regular NROTC program. The criteria were active duty fitness report ratings and career decisions, which became known in 1963 at the end of the obligated service of the accepted 1955 applicants. No predictive relationship was found.

It is recommended that until valid techniques are available to predict fitness and career decision, increased use be made of the present academic predictors in order to maximize the number of Regular NROTC officers who will graduate from college and become eligible for retention. The selection interview should be used only to screen out applicants of very low quality, and not be used in attempts to discriminate among applicants who are in the acceptable range.

Research Report on Improvement of Personnel Utilization in Closed Circuit TV Maintenance. PRAW, Report No. 64-46, June 1964

This report presents findings which are designed to improve fleet input to the Closed Circuit TV Maintenance Course which in turn will provide the fleet with an adequate number of closed circuit TV maintenance personnel. The report is concerned primarily with the Pilot--LSO Landing and Television (PLAT) System Recommendations include proposed changes to entrance requirements for the Closed Circuit TV School at Great Lakes.

A Study of the System for Assigning Technical School Graduates. PRASD Report No. 236, June 1964. Oscar B. Holt.

This report, based on a study of the initial duty station assignments of over 2,000 graduates from 13 technical "A," "B," and "C" schools, indicates a high overall effectiveness of the present system for assignment of technical school graduates but also points out some areas in which possible improvements could be made.

Recruit Training and Reenlistment: Research Recommendations. PRASD Memorandum Report No. 64-20, September 1964. Warren S. Blumenfeld.

Based upon direct observation and comments of the RTC staffs and recruits, and building upon the rationale of (a) recruit training is a job sample and (b) past behavior is predictive of future behavior, several areas of research thought to be promising in terms of concentration of research of recruit training and reenlistment were identified by extended visits to Navy Training Centers and other Defense Department installations concerned with the recruiting and early training of enlisted men.

A general thesis concerning recruit training and reenlistment is presented. This thesis centers around a "dissonance-reduction" hypothesis regarding career motivation. The hypothesis is that career motivation is related to the degree of agreement of values between the individual (recruit) and the institution (the Navy with which the recruit comes into contact), and that, as the discrepancy of values between the recruit and the Navy deviates from zero, the probability of reenlistment decreases. It ~~is~~ submitted that this thesis is applicable to each of the several research areas identified. The Problem of criteria is discussed, and an experimental research program with which to investigate the thesis in the research areas is presented in detail.

A recommendation is made for a four-year longitudinal follow-up study. The extension of the present research methodological framework and approach to other areas of naval personnel research is proposed.

Performance Rating: A Data-Retrieval Bibliography. PRASD Report No. 261, December 1964. Loyda Shears.

Performance rating literature dealing primarily with officer performance, but also including provocative research in the performance area based on enlisted and civilian subjects, was abstracted for inclusion in this bibliography.

To facilitate access to the varied findings throughout the articles abstracted, a master outline was used as a guide to the abstracting process. Each article was then keyed to this master outline. When used for its intended purpose, that of data-retrieval, the topic of interest is first located in the master outline. The master outline indicates the articles which contain information on the topic and also indicates the location within the abstract wherein the topic is discussed, thus facilitating the location of the information sought.

Preliminary Report on Identifying Retention-Related Variables with Statistical Supplements A and B. PRASD Report No. 248, December 1964. Everett E. Johnston, Jr.

Under the direction of the Chief of Naval Personnel, this Activity is conducting a comprehensive research project on enlisted retention. One of the major phases of this research is a Navy-wide questionnaire survey of approximately 5000 men which was recently completed. The data obtained in this survey will be combined later in this research with data obtained from other sources and then correlated with retention figures on the men surveyed.

The full significance of the survey data with regard to retention will not be known until the correlations are found. However, it is believed that in the meantime a summary of the frequency tabulations of the responses to the questionnaire would be of interest to those concerned with the retention problem and, therefore, this report was prepared.

The frequency tables are presented in the two supplements to this report. A description of the survey procedures and the sample contacted is presented in the report and a copy of the questionnaire is contained in the Appendix.

Off-Duty Employment of Naval Personnel. January 1965. E. P. Somer. (W)

A survey was conducted during October 1964 to obtain information concerning the incidence of off-duty employment among a purposive sample of male Navy personnel and on the incidence of employment of their dependents. The sample consists of 1775 enlisted men and 178 officers at four major shore installations and two ships.

The incidence of "Moonlighting" among shore based enlisted men ranged, depending on the installation, from one in four to nearly four in ten. No clear difference in the frequency of "Moonlighting" was found between shore based and sea based enlisted men. Among those enlisted men who had an extra income from "Moonlighting," the preponderant opinion was that their standard of living would be unsatisfactory without their outside income. Enlisted dependents worked most frequently at unskilled and white collar jobs. Officers' dependents were most frequently employed as professional and white collar workers. Since only four officers in a total of 178 reported "Moonlighting" the week prior to the survey, no further analysis was made of officers' off-duty employment.

Validation of an Experimental Biographical Information Blank as a Predictor of Success in Electronics Schools. PRASD Report No. 256, January 1965. Patricia Thomas, Edmund Thomas and Leonard Swanson.

In an analysis of an experimental 50-item Biographical Information Blank (BIB), empirically derived keys were developed for three different electronic ratings using two samples from each school (6 samples in all). Several different keys were based on items correlating at least .10, .15, and .20, respectively, with final school grade. Most of the items valid enough to warrant inclusion in the best emprical keys were of an academic nature and appeared to be measuring much the same dimension of achievement as the present selector tests. Furthermore, this biographical inventory was relatively narrow in coverage when compared with many biographical inventories.

Zero-order and multiple correlations were computed for the currently used school selector tests and the various BIB keys. Scores from all BIB keys were found to be significantly related to school grades. However, only two of the 18 keys developed (both on the same school sample) were found to add significantly to the predictive validity of the official selector tests, mainly because of overlap in content covered by the biographical items.

Further research on this specific instrument was not recommended, since significant improvement in the multiple R was found for the keys developed on only one sample and since this increase in validity was small. This recommendation should not preclude further developmental work on the use of a broader array of biographical information in the prediction of enlisted school or job performance.

Opinions of Naval Personnel Toward Dependent Medical Care. February 1965. (W)

Questions concerning opinions of the Naval Medical Program for Dependents (Medicare) were included in the Navy Personnel Survey 64-1, conducted in September 1964. The sampling scheme produced responses from some 3800 officers and 16,000 enlisted men. This report presents the relevant findings on the opinions of officers and enlisted men concerning this program.

Generally, Medicare was looked upon favorably by the respondents, especially by those with dependents. When asked to compare the treatment Navy dependents obtained to that which civilians receive, men with more dependents reported they thought less of the Dependents Medicare Program than did those with fewer dependents. There was general agreement among those whose dependents had used Medicare that the treatment last received was good. Among those with dependents, one in every two enlisted men and one in three officers felt the lack of military dental care for dependents had affected their dependents health.

Career Motivation of Enlisted Personnel in Relation to Opinions of Current and Proposed Conditions of Naval Service. March 1965. C. Hodges. (W)

Three thousand eight hundred male officers and 16,000 enlisted men were samples for the Navy Personnel Survey 64-1 in September 1964. The purpose of this study is to display for management the relationships between indicated career intention of enlisted men and their opinions about possible changes in Navy policy and various aspects of Navy service. Primary focus was on personnel with less than six years of service, as this group has the lowest reenlistment rate.

Findings indicate that the changes chosen as those which, if instituted, would be most influential in motivating all categories of enlisted men to reenlist were: "Fifty percent more base pay," and "Guarantee assignments to a preferred duty choice." Of current Navy programs and policies, "Pay and allowances" was considered to have the greatest effect on career decisions for the total groups; "Retirement benefits" for groups with six or more years of service, and "Advancement opportunities" for the career-oriented personnel with less than six years of service.

Career Intentions and Other Factors Related to Length of Work Week. March 1965. (W)

Information concerning the length of the work week and its relation to such factors as sea/shore duty, ship type, and pay grade is reported from a representative cross section of 16,126 enlisted men and 3,786 male officers. The data stem from questions included in the semiannual Navy Personnel Survey 64-1 conducted in September 1964.

Findings indicate that, for all personnel combined, whether at sea or at shore, about 6 in 10 officers and enlisted men reported working fifty hours or more at their assigned Navy duties. One in five worked seventy or more hours. Among personnel who were at sea all week, 59% of enlisted men and 79% of officers worked sixty or more hours that week. Regardless of ship type, officers worked a longer work week than did the enlisted men. About 6 in 10 officers and enlisted men aboard carriers worked sixty or more hours a week. Aboard auxiliary vessels, which had the shortest work week, two in ten enlisted men versus three in ten officers put in sixty or more hours. Length of work week was also found to be related to pay grade within each of the officer and enlisted categories; the lower pay grades putting in a longer work week than their seniors.

An Evaluation of Various Measures of High School Performance in Predicting College Achievement for Freshman NROTC REgular Students. STB 65-2, March 1965. Edmund Thomas, Patricia Thomas and Leonard Swanson.

This research was designed to investigate the validity of high school performance, measured in a number of different ways, in the prediction of college freshman grade point average.

Grades on high school transcripts obtained from 13 NROTC units were transformed to a 15-point grading scale. Statistical analyses were conducted to determine the validity of individual high school course grades and a number of general curriculum areas as predictors of freshman college grade point average.

Academic high school grade average, the grade average of liberal arts courses, and overall high school grade average correlated higher with college achievement than the presently operational High School Rating (HSR), although the increase in validity in each case was not statistically significant. None of the other composites of courses or individual course averages attained as high a correlation with the criterion as did HSR. In the multiple regression analysis a combination of three individual course averages, Foreign Languages, History, and Physics, correlated higher with first year college grade point average than did any other index of high school performance.

It was recommended that HSR be retained as a selector for the NROTC Regular program since it is more easily derived than the grade averages investigated in this study. It was further recommended that a new form specifically requesting high school rank-in-class be developed in an effort to obtain this statistic for all candidates. A suggested format for such a form was included.

Opinions of Present and Proposed CPO/Officer-Type Uniforms for First and Second Class Petty Officers. March 1965. E. P. Somer. (W)

This study concerns opinions of officers and enlisted men regarding the present uniform worn by enlisted men in ratings below Chief Petty Officer, and various proposed uniform changes. Questions on this topic were asked as part of Navy Personnel Survey 64-1, conducted in September 1964, which sampled a representative cross section of 16,126 enlisted men and 3,786 male officers.

Findings reveal that half of the enlisted men and seven in ten of the officers (Captain and below) thought the present enlisted uniform was either "Good" or "Very good." Among officers, satisfaction of the present enlisted uniform increased progressively from Ensign through Captain. Chief Petty Officers voted by an overwhelming majority against the proposal to permit first and second class Petty Officers to wear a uniform like those worn by Chief Petty Officers. Most officers also voted against each of five proposed changes which would alter the appearance of the standard jumper-type uniform worn by the lower enlisted grades. A large majority of the enlisted men who were undecided about their career plans favored the proposed uniform changes.

Recruit Training and Reenlistment: An Overview. STB 65-1, March 1965. Warren S. Blumenfeld.

This report describes the first phase of a study aimed at determining to what recruit training experiences may be related to reenlistment four years later. Extended visits were made to the Recruit Training Commands at San Diego and Great Lakes in order to become familiar with Navy recruit training and to obtain information regarding recruit values, beliefs, and expectations. Basic training centers of the Army, Air Force, and Marine Corps were also visited to obtain a frame of reference with which to evaluate the observations, information, and comments obtained at the Naval RTCs.

Based upon direct observation and comments of the RTC staffs and recruits, and building upon the rationale that (1) recruit training is a job sample and (2) past behavior is predictive of future behavior, the following areas were suggested to be the most promising in terms of concentration of research attention:

a. Specific attitude objects (factors), e.g., Sailor, Company Commander, Service Week, Discipline, and Marlinspike;

b. Discrepancies between the recruit's expectations and his actual perceptions of recruit training;

c. Tolerance of school situation, i.e., attitude towards and ability to survive in the academic aspects of recruit training;

d. Group living;

e. Company composition; and

f. Duty and responsibility, e.g., accepting "needs of the service" as a way of life.

Attitudes Toward Dependents' Housing and Their Relationships with Career Intention. Report No. 11, April 1965. (W)

Findings are presented on the attitudes of married officers and enlisted men concerning the housing occupied by their dependents. Particular reference is made to relationships of attitudes with career motivation. Information was obtained from questions included in the semi-annual Navy Personnel Survey 64-1 conducted in September 1964, which sampled a cross section of 16,000 enlisted men and 3,800 officers.

Family housing was considered an important factor in their career decision by three out of four enlisted men. Nearly three out of four married enlisted men preferred owning their own home to any other type of housing, government owned or rented. Among career motivated enlisted men, fewer of those who were ineligible for dependent housing thought this was an important factor than of those who were eligible. At least ninety percent of all officers perceived their housing as adequate or better. Officers with higher ranks more frequently occupied government family quarters than did those with lower ranks. Occupancy of government housing was also associated with shore assignment and more dependents.

Opinions of Navy Personnel Toward Dependents' Housing. Report No. 1, April 1965. E. Toban and A. K. Showalter. (W)

Attitudes and opinions of officers and enlisted men about the housing occupied by their dependents are reflected in the findings of this report. Questions pertaining to this were included in Navy Personnel Survey 64-1 conducted in September 1964. The sample consists of 16,000 enlisted men and 3,800 officers.

Generally, both officers and enlisted men were satisfied with their dependents' housing. The degree of satisfaction was related to pay grade. Government owned apartments fell at the bottom of the list of housing preferences. Owning their "Own home" was preferred by half of the officers and 7 out of 10 enlisted men. Among officers, increasing rank was correlated with a greater preference for government owned detached housing and less preference for personally owned homes. Enlisted men would choose "Own home" more frequently than any other type housing regardless of their pay grade. The incidence of dependents living near home port or duty station was higher for career-motivated men than non-career-motivated men.

Some Reasons Why Men Elect to Join the Submarine Service: A Content Analysis of Interviews. SRR 65-2, April 1965. Warren S. Blumenfeld.

Interviews of 60 first-enlistment electronics-type men in Submarine service indicated that higher pay was the primary reason why they elected to join the Submarine service. Other reasons were also in evidence. Most unexpected of these other reasons (contrary to responses of a comparable group of reenlisted electronics-type personnel in the Submarine service) was the reoccurring theme of adventure-travel-glamour.

A recommendation for a more definitive research project to handle some of the questions raised regarding the impact of experience in Submarine service was made.

What Reenlisted Electronics Personnel Value: A Comparison of Interviews of Submarine and Surface Personnel. SRR 65-1, April 1965.

The purpose of this study was to provide information as to what traits, characteristics, needs, aspirations, or any other dimensions of behavior differentiate the kinds of electronics rating personnel who reenlist in the Submarine service from the electronics rating personnel who reenlist in Surface ships (which normally have lower reenlistment rates than the submarine fleet has). Structured interviews were conducted with 108 submarine service electronics personnel, who had reenlisted at least once, and with 157 surface fleet electronics ratings, who had reenlisted at least once, during the time frame 15 March 1965 through 2 April 1965 at New London, Norfolk, Newport, San Diego, and Hawaii.

Among several hypothesis suggested as explanations for the difference in reenlistment rates were: the qualitative analysis of the responses suggested that the Submarine personnel appeared to be more "job and boat" oriented than "Navy" oriented. To a degree, they appeared to be more realistic and materialistic in their overall approach to naval service, while the Surface personnel who were their counterparts appeared to be more "institution" oriented and adventurous and idealistic in their approach to naval service.

No really clear-cut differences between the Submarine and Surface reenlistees were readily apparent in the data collected in this study. Whether this was a function of the circumstance that there are in fact few--if any--differences between the two highly selected and homogeneous groups, or, whether this was due to the limitations and/or lack of sensitivity of the study method was not determined. Allowing for the lack of clearcut differences, trends in the data were such to suggest that these Submarine personnel were more narrow and self-centered in Navy life orientation; they appear to be concerned with realistic and materialistic matters; and they appear to identify with a "smaller" organization. On the other hand, the Surface personnel were more broad and less materially selfcentered in Navy life orientation; they appear to be concerned with adventurous and idealistic matters; and they appear to identify with the "larger" institution.

It was suggested more information about these differences could be obtained by determining: (a) if men initially assigned to submarine duty contained a larger proportion of career-motivated personnel when assigned, and (b) what differences exist between "non-reenlistees" in the two groups.

A Comparison of Responses to a Vocational Interest Test Taken under Standard Conditions at Recruiting Stations and Responses to the Same Test Taken as a Self-Administered Test at Home. SRM 65-3, May 1965. Richard R. Stephenson, Lou Hicks Smith and Bernard Rimland.

The Strong Vocational Interest Blank (SVIB) was administered experimentally to all applicants for the 1964 NROTC (Regular) program. For a variety of administrative reasons, none systematically biasing, 213 of these applicants took the SVIB at home as a self-administered test. This group was matched with a group tested under standard conditions at Recruiting Stations. Comparison of responses revealed no differences which were not explainable as random sampling fluctuations. Since the experimental nature of the testing was not revealed to the applicants, these findings indicate that vocational interest tests may be taken at home as part of an operational selection battery. Such tests, mailed to the applicant and returned by mail prior to the applicant's reporting data, could be scored and interpreted for use at the time of the applicant's initial processing and interviewing.

A Computer Program for the Maximum Likelihood Analysis of Types. STB 65-15, May 1965. John H. Wolfe.

This report contains a description of a computer program for estimating the parameters of a mixture of multivariate normal distributions with unknown frequencies, means, and covariances. The basis equations for the procedure are presented for the first time here, with their derivation omitted. An example with the results of the computer printout is described for an artificially constructed mixture of three bivariate normal distributions. The method of using the program and the Fortran listing are detailed in this report.

Naval Adjustment and Delinquency: A Review of the Literature With Recommendations for Future Research. SRM 65-4, May 1965. Richard R. Stephenson.

A comprehensive review of the literature concerning the naval delinquency problem was undertaken. This review led to a summarization of all relevant research findings and a further summarization of the recommendations of earlier writers in this area. Following a critical evaluation of both summaries and of the assumptions underlying the traditional approach, it was concluded that the traditional approach to the identification of the delinquent-prone was approaching an asymptote of effectiveness. Accordingly, a new approach, based upon the concepts of occupational choice, satisfaction, and adjustment, is recommended. A comprehensive, but general, research design is proposed to investigate and evaluate this new approach.

Opinions of Pilot Program Uniforms Worn by First and Second Class Petty Officers. May 1965. B. T. King and E. P. Somer. (W)

A study was conducted for the Permanent Uniform Board to obtain opinions and attitudes from a selected group of enlisted men in pay grades E-5 and E-6 (N=1,000), who wore an experimental Chief Petty Officer type uniform from March 1964 to March 1965. Opinions were also obtained from 2,000 enlisted men and 1,000 officers who observed the wearing of the test uniforms. This report presents the findings of a survey conducted to determine the opinions of Participants (those who wore a test uniform) and Non-participants (those who observed others wearing test uniforms).

With the exception of Chief Petty Officers, a large majority of Participants and Non-participants expressed a favorable opinion of the test uniform which, if adopted, would be worn by personnel in pay grades E-5 and E-6. Approximately half of both Participants and enlisted Non-participants stated their own reenlistment plans would not be affected either way if the Chief Petty Officer type uniform were to be adopted. Sizeable minorities below the level of chief indicated they would be more inclined to reenlist if the uniform change occurred. Most Chief Petty Officers thought wearers' attitudes toward the Navy had not changed during the test period. However, as many as four in ten officers detected improvement in this respect. A large majority of the Participants indicated they received favorable comments and were treated better by civilians when wearing the Chief Petty Officer type uniforms. The participants also reported their wives' reactions were favorable.

Survey of Junior Officer Retention: I. Why USN Officers Resign from the Navy. May 1965. V. Fields. (W)

Questionnaire responses of 93 Regular Navy (USN) officers in categories 1100 (Unrestricted Line, Surface), 1310 (Unrestricted Line, Aviator), and 1350 (Air Intelligence Officers) were analyzed to determine why USN officers resign from the Navy.

Recalling their Navy career interest at various times, they reported a sharp drop in interest after two years of active duty. Half of the officers indicated benefits of subsidized education caused them to enter the Navy. Fourteen percent of the wives were favorably disposed toward the respondents' Navy careers. The most important reason for deciding to resign was "Limited home life;" the next in importance, "Poor utilization of abilities and skills," and "Excessive sea duty." The respondents' perception of satisfactions was moderate except for "Feeling of job security" which received the highest rating, and "Feeling of self-fulfillment" which received the lowest rating. Poorly rated were opportunity for "Independent thought and action," "Participation in setting goals," and "Feelings of worthwhile accomplishment." Most (seventy-eight percent) stated the pay was acceptable or quite satisfactory. Favorable aspects of duty assignments were the opportunities to "Mature personally," "Assume responsibility," and "Learn to handle men." When asked what the Navy could do to make a career more attractive, the three most important actions were "Make better use of officers' abilities," "Increase prestige of officer corps," and "Provide for more time at home."

Survey of Junior Officer Retention: II. Why USNR Officers Leave the Navy and Some Stay. May 1965. V. Fields. (W)

The purpose of this second section of the Junior Officer Retention Survey was to assess the reasons why some United States Naval Reserve officers request release from active duty at the end of their obligated service, while others request transfer to the Regular Navy. The sample consisted of 180 stayers and 1,309 leavers. Only those whose source of commission was other than the Naval Academy or the NROTC (Regular) Program were considered.

Findings indicate the leavers were younger, of lower rank, less frequently married, and almost entirely 1105's (Line Officers in the Reserve Program). A greater percentage of leavers than stayers had graduate education and degrees. The leavers tended to choose "Did not use my training," "Inconsiderate superiors," "Too much time at sea," and "Excessive administrative duties" as the single worst feature of their assignments. The stayers tended to choose the latter two. The stayers objected less to "Unscheduled operations" while in home port than did the leavers. The stayers differed from the leavers on the question of the importance of graduate work. The leavers indicated that post-graduate training would not have benefited them, while the stayers indicated that it would have. A list of twenty-five factors relating to personal satisfaction was presented to both groups. The stayers felt that a greater degree of personal satisfaction could be obtained by a Navy, as opposed to a civilian career. However, most of the stayers judged that civilian life offered more opportunity in respect to good pay, adequate family housing, freedom of thought and action, stability of home life, and success through ability alone.

Career Motivation of Naval Officers. June 1965. E. Toban and H. J. Dupuy. (W)

The purpose of this report is to show the relationships between expressed career intention of Naval officers and their opinions about possible changes in Navy policy and various aspects of naval service. The findings are based on data obtained from 3,786 officers surveyed in September 1964 (NPS 64-1).

The most desired changes among officers with less than six years of service was "increased pay and allowances" for those planning a Navy career, while "make better use of each man's abilities" was most desired among the officers not planning a Navy career.

Current Navy programs and policies having the greatest effect on career decision were "advancement opportunities" for the career oriented and "use made by my abilities" for the undecided and non-career oriented officers.

A Critique of Ipsative Measures with Special Reference to the Navy Activities Preference Blank. STB 65-16, June 1965. Lou H. Smith.

A review of the relevant literature describing mathematical and empirical properties of ipsative and nonipsative measures was undertaken. This evaluation led to the explication of a simple procedure for quantifying the "degree of ipsativity" in psychological measuring instruments. Several published research studies were evaluated against this "index of ipsativity" leading to a conclusion that purely ipsative test instruments possess such extensive psychometric and statistical limitations that utilization of such instruments is not recommended. It is recommended that future research on the Navy Activities Preference Blank, an ipsative test, be directed toward removal of the purely ipsative properties from this test.

Extent of Knowledge Concerning Naval Personnel Programs. June 1965. H. J. Dupuy. (W)

Twenty-nine objective questions concerning various Navy personnel programs included in the Navy Personnel Survey 64-1 were administered to a random sample of some 3,800 officers and 16,000 enlisted men. The purpose of this report is to present data on the level of knowledge among respondents to questions dealing with the following personnel programs: Education, medical assistance, indemnity compensation, survivors benefits, social security, reenlistment, and training.

A relatively low level of knowledge was indicated by officers and enlisted men concerning three compensation programs. Results reveal that, generally, a rise in the level of knowledge of these programs is correlated with a rise in grade and in the number of dependents. However, officers generally revealed at least twice as much knowledge about these programs as enlisted men. A sizeable number of the officers (41%) incorrectly thought the Navy required only one year of obligated service for each year of paid education. The majority of the enlisted men correctly answered questions about education and training programs. A fairly low level of knowledge about reenlistment incentive programs was indicated.

Influence of Questionnaire Items on General Attitude Towards Job. SRM 65-13, June 1965. William H. Githens.

Three types of questionnaires were distributed to naval officers commissioned from NROTC classes. One type asked for information on only the positive aspects of a naval career; the second type asked for information on only the negative aspects of a naval career; the third type asked for information on both the positive and negative aspects of a naval career. Each officer completed only one of the questionnaires. All questionnaires contained a rating scale for indicating general attitude towards a naval career. There was no difference between questionnaire types in the distribution of marks on the general attitude scale. It was concluded that responding to questions concerning only positive or negative aspects of a job does not influence general attitude towards the job.

Internal Consistency Reliability and Concurrent Validity of an Experimental Measure of Motivation in a Selected Group of Personnel Researchers. SRM 65-8, June 1965. Warren S. Blumenfeld.

The internal consistency reliability and concurrent validity of an experimental measure of motivation, the Selective Word Memory Test (SWMT), were investigated in a subject population of 44 professional civilian personnel researchers at the U. S. Naval Personnel Research Activity, San Diego (PRASD). The validation criterion was supervisors' ratings. The rationale and development of the SWMT were briefly described. The data indicated that the SWMT was of satisfactory internal consistency; however, it did not demonstrate satisfactory concurrent validity in this group of subjects. Recommendations were made as to further research with an instrument of this type.

Navy Personnel Survey 65-1. Basic Report. June 1965. (W)

This is the first Basic Report emanating from the Navy Personnel Survey (NPS) series. The report was published in a format to provide statistical data in the most economical and expeditious manner to interested parties.

The survey questionnaire was administered during June 1965 to a worldwide sample of 5% of the male officers, 3% of the enlisted men, and 74% of the enlisted Waves. Responses to questions concerning retention, procurement, recruitment, performance, advancement, personnel support facilities, bachelor housing, family quarters, and background information, were obtained.

Responses to all questions are displayed by pay grade and Designator/Rating groups.

Officer Assignments in Weapons Engineering. PRL Report No. WRM 65-7, June 1965. Washington, D. C. J. M. Pugh, W. L. Himes and K. W. Gray.

A report of an analysis of current practices concerned with weapons engineering officer assignments to billets. It includes recommendations for further study in certain areas concerning these assignment practices.

Opinions of Pilot Program Uniforms Expressed by Operational or Administrative Commanders and by Commanding Officers. June 1965. (W)

This supplement to the Uniform Pilot Program Report presents the opinions of three groups of Commanding Officers concerning enlisted men at the E-5 and E-6 levels who wore an experimental Chief Petty Officer type uniform for one year. The Commanders' opinions were expressed in letters. The three groups of officers were: (1) Operational and Administrative Commanders involved in the program; (2) Commanding Officers of stations where the uniform was worn and (3) Commanding Officers of Aviation Commands where the uniforms were not worn.

Operational and Administrative Commanders were divided in their opinions of the test uniform. The ten Commanding Officers of the ships, stations, and squadrons, where First and Second Class Petty Officers wore the test uniforms predominantly expressed favorable opinions of the experimental uniforms. The Commanding Officers of non-participating Aviation Commands generally expressed favorable opinions of the test uniforms and of the proposal to adopt them for future use below the Chief Petty Officer level. Some negative comments concerning the stowage and maintenance problems associated with the proposed uniform change were made by some of the respondents.

Survey of Junior Officer Retention: III. Why Some USNR Officers Request Voluntary Recall to Active Duty. June 1965. E. P. Somer. (W)

The Junior Officer Retention Survey included this section designed to identify some of the reasons why United States Naval Reserve (USNR) officers request voluntary recall to active duty. The sample consisted of 180 stayers and 1,309 leavers. Only those whose source of commission was other than Naval Academy or the NROTC (Regular) Program were considered.

Findings reveal that positive attitudes concerning a wide variety of characteristics of Navy life are especially prominent among officers who requested voluntary recall. Seventy-eight percent of the recalled officers selected "Opportunity for new experiences" as one of the most favorable features of a Navy career, while "Retirement pay" was listed as one of the most favorable by fifty-seven percent. "Promotion opportunities" and "Training" were each listed by four in ten of the officers as one of the most favorable features of a career. Eighty-seven percent of the recalled officers rated themselves above average in comparison to other officers of similar rank and designator as to overall confidence in their ability as a naval officer. Ninety-seven percent of the married officers in this sample indicated that their wives had a quite favorable attitude toward the Navy.

Validation of the 1961 Navy College Aptitude Test. STB 65-17, June 1965. Loyda Shears and Leonard Swanson.

The purpose of this study was to evaluate the effectiveness of the Navy College Aptitude Test (NCAT) administered in December 1961 for predicting freshman college grade averages and Naval Science course grades. High School ratings were validated along with NCAT total and subtest scores for 1345 midshipmen from 42 of the 52 colleges participating in the NROTC (Regular) program. Analyses were made for each school and for the entire sample.

Validities of NCAT subtest and total scores were lower than those obtained in three earlier years. The validity of high school ratings for the 1961 sample, however, was similar to those previously obtained. Results of item analysis of one NCAT subtest suggested that improved item selection procedures would be required to increase NCAT validity to earlier validity levels.

Development of the Short Basic Test Battery Form SB-2. PRL Report No. WTB 66-1, July 1965. DDC No. AD 468 060.

This report describes the development of an alternate form (Form 2B-2) to the current Form SB-1 of the Short Basic Test Battery (SBTB), in which the tests are one-half to two-thirds the length of those in the current form of the Basic Test Battery (BTB).

The method used in developing norms and the results of correlational analysis ensure that the newly-developed tests in Form SB-2 of the SBTB are sufficiently reliable and predictive of the scores of enlisted applicants on the corresponding tests of the BTB itself. The results further indicated that Form SB-2 tests are sufficiently equivalent to their Form SB-1 counterparts in these and other essentials to warrant use of the two SBTB forms, if desired, as interchangeable instruments in the preliminary classification of enlisted applicants.

Analysis of Navy Enlisted Personnel Retention Variables. SRR 66-1, August 1965. Bradley B. Nickey and R. V. May, Jr. DDC Accession Number AD 620 674.

This report presents the results of a partial analysis of the responses of a Navy-wide questionnaire survey of over 5,000 enlisted personnel. Fifty-nine out of 85 items in the questionnaires were found to be significantly related to retention. Bar charts are presented showing the percentage of reenlistment of personnel who selected the various alternative answers in each of these 59 items.

Attitudes of Naval Personnel Toward Shore Facilities. August 1965. A. K. **Showalter** and H. J. Dupuy. (W)

As part of Navy Personnel Survey 64-1, conducted during September 1964, questions were asked a sample of naval personnel concerning their opinions of various naval recreational/Special Service and other personnel support facilities. Sixteen thousand, one hundred twenty-six enlisted men and 3,786 male officers composed the sample. The opinions of the facilities were analyzed by educational level, pay grade or rank, number of dependents, ship type, and career intentions for men with less than six years of service.

Generally, level of education was shown to be related to opinions of facilities. The tendency to have less favorable opinions increased with the level of education. Personnel who were career-motivated held slightly more favorable opinions of the facilities than the non-career men. The three most favorably listed facilities rated by enlisted men were: religious, medical/dental, and movies. Officers rated religious facilities, swimming pools, and ball fields as the three most favorably listed facilities. Officers and enlisted men, in general, expressed poor opinions of their living quarters. A trend could be seen involving a positive correlation between advancement of rank and less favorable opinions of naval facilities.

Investigation of the United States Navy Clerical Aptitude Test, Form 6. STB 66-7, August 1965. Ervin W. Curtis. DDC Accession Number AD 620 668.

An investigation of the content, format, and validity of the USN Clerical Aptitude Test, Form 6 (CLER) was undertaken. The data of a previous investigation were analyzed to determine if the statistical assumptions underlying the data analyses were satisfied, to determine the effect of waivers (selectees whose selection test scores were below the operational cutoff) upon the validity coefficients, and to determine how well CLER would predict broad categories of final grade in selected A-Schools. It was concluded that previous analyses gave a true indication that CLER contributes only slightly, although significantly, to the selection of recruits for these schools. Various ways of improving CLER and its utilization were considered. For a sample of students in SK and YN A-School at San Diego, final grades were compared with the number and kinds of errors the students had made on CLER. No substantial association between these variables was found. Several aspects of the format of CLER were critically evaluated. The investigation was extended to the search for a clerical aptitude test that would be more valuable to the Navy than CLER. Eleven short clerical aptitude tests were administered to successive classes in seven A-Schools. Scores on several of these tests were more highly correlated with final grade than were CLER scores. These tests also augmented the correlations of GCT and ARI with final grade more than CLER did.

The principle recommendations were:

1. Replacement of CLER by its short form (USN Clerical Aptitude Test, Form SB-1) until a better test can be put into operation.

2. Construction of a test similar to the Coding Test of the U. S. Army Clerical Speed Test, followed by research to determine the advisability of replacing CLER with the Navy version of that test.

School Validation of the Basic Test Battery and of Other Classification Tests (1962-1963). STB 66-8, August 1965. Patricia J. Thomas and Edmund D. Thomas. DDC Accession Number AD 621 540.

The Basic Test Battery (BTB) is used in the selection and classification of enlisted men for Class "A" schools. This report presented the results of the validation of Form 6 of the BTB as a predictor of final school grade in 91 Class "A" schools. In addition to the four BTB tests, the Electronics Technician Selection Test, Radio Code Test, and Sonar Pitch Memory Test, were included in the analyses. Each sample was validated independently using both graduated and academically disenrolled students attending school during the 1962-1963 period. All analyses were of a correlational nature (zero-order, multiple regression, and linear sum) and results were reported both with and without corrections for restriction in range.

The most noteworthy finding was the increase in prediction when all of the BTB tests were used in the regression equation, as compared with the customary practice of using cutting scores on one or two tests of the battery. The former method has not been employed for recruit classification because of prohibitive expense. However, the introduction of computer processing into the selection procedure will eliminate this objection. A significant improvement in the prediction of Class "A" school performance will be realized through the use of all instead of only a few of the BTB tests and through employing best weights rather than equal weights in determining selection-composite scores.

U. S. Navy WAVE Recruit Survey 1965. August 1965. V. A. Tribble. (W)

The WAVE Recruit Survey was conducted in August 1965. Questionnaires were administered to 501 WAVE Recruits at Bainbridge, Maryland. The survey was conducted in order to obtain information concerning recruiting experience, service attitudes, and self and family reactions toward Navy life.

Most recruits decided to enter the Navy while in high school, and nearly seven in ten joined either for the education and training advantages, or to become more mature and self-reliant. Almost half reported that Navy recruiters gave them the impression that they would be assigned to a job field of their choice and one in four received the impression they would be assigned to a geographical area of choice. Nine in ten would join the Navy again if they had it to do over and would encourage qualified women to enlist. The two main career-field preferences were clerical/administrative, and medical, each chosen by nearly 30% of the women. Most of the Waves were very receptive to several suggested programs to be scheduled on off-duty hours. Almost 90% felt that their families were glad they had enlisted in the Navy.

Validation of the 1962 Navy College Aptitude Test. STB 66-6, August 1965. Edmund Thomas and Patricia Thomas. DDC Accession Number AD 619 990.

This is a study of the validity of the 1962 edition of the Navy College Aptitude Test (NCAT) as a predictor of Grade Point Average (GPA) and Naval Science Grade (NSG) in the freshman year of college. The validities of High School Rating (HRS), NROTC Questionnaire, Interviewers' Appraisal of Motivation, and the Verbal and Mathematical scores of the Scholastic Aptitude Test (SAT) were also determined. The sample included 1252 Regular NROTC midshipmen attending 52 colleges and universities throughout the United States.

Validities of the individual and experimental NCAT subtests ranged from .20 to .34 when predicting GPA, and from .09 to .26 when predicting NSG. The NCAT Operational Score correlated .36 with GPA and .23 with NSG. HSR was the most valid predictor whether used alone or in combination with the NCAT. The NROTC Questionnaire and Interviewers' Appraisal were less predictive and, in some cases, negatively correlated with the criteria. Comparison with the previous year's edition of the NCAT demonstrated a consistency in the validity of the best and poorest subtests and revealed that the 1962 NCAT was more valid than the 1961 instrument.

Recommendations included: (a) the incorporation of the experimental Spelling subtest as an operational part of future editions of the NCAT because of its significant validity; (b) that the NCAT Selection Score be raised to the 60th percentile; (c) that the selection of applicants with HSRs below four be curtailed, and (d) that more rigorous techniques be applied in future subtest construction and revision in order to improve the predictive validity of the battery.

The Development and Evaluation of a Forced-Choice Letter of Reference Form for Selecting Officer Candidates. STB 66-10, September 1965. Bob D. Rhea, Bernard Rimland and William H. Githens. DDC Accession Number AD 623 084.

The purpose of this project was to develop a new form of the Inquiry Questionnaire used in obtaining character references for OCS candidates. Five alternate forms of an experimental reference letter were constructed of forced-choice type personality items. These forms were distributed, along with the operationally used reference questionnaire, to some 12,000 persons named as character references by the 2,000 applicants for six OCS classes. Six completed forms were thus available on the average for analysis for each accepted officer candidate. The criterion used in the analysis was the average fitness report rating received by the officer during his first 18 months of naval service. Scoring keys, developed through analysis of items against this criterion were derived on part of the sample and validated on the remainder of the sample.

Essentially, the findings were negative. Despite the construction of a number of different types of scoring keys, designed to test a variety of hypotheses concerning officer fitness, there was no substantial evidence that the experimental instruments would improve upon the current operational inquiry questionnaire.

A Method for Conducting Manpower Utilization Surveys in Navy Aircraft Squadrons. SRM 66-7, September 1965. Randall F. Whitehead.

In response to a request from the Chief of Naval Operations, the Chief of Naval Personnel (Pers-A3) requested this Activity to conduct a research study to develop a method for conducting manpower utilization/validation surveys in Navy aircraft squadrons. The final proposed "handbook" resulting from this research is presented in the appendix of the report. The handbook is intended for use by field teams operating under the CNO-sponsored Navy Manpower Validation Program.

The Effects of Correcting Early Fitness Reports for Situational Factors. SRR 66-7, November 1965. William H. Githens, Bernard Rimland and John H. Steinemann. DDC Accession Number AD 624 142.

The major purpose of this investigation was to determine the need for making statistical corrections to the fitness reports of junior officers to adjust for possible inequities due to extraneous situational factors. The situational influences for which corrections were made were: (a) type of duty stations at which reports were made, (b) number of reports (up to 5), the officer had received, and (c) rater familiarity with the junior officer, as measured by the number of successive reports completed by the same rater. The analysis was conducted on the reports received during the first 18 months of active duty of 1,338 members of the NROTC graduating class of 1959. The sample was fractionated into groups homogeneous with regard to the variables being studied. Standard scores were computed for each subgroup, and these were compared with raw, unstandardized mean fitness scores for the total group. The corrections made had very little influence on the original, uncorrected, rank order of the officers.

Although conducted while developing a means of using early fitness reports as a research criterion, the findings of this study were encouraging in that they suggest the fitness report to be relatively uninfluenced by extraneous factors as used operationally.

The Relationship of OCS Grades to Officer Fitness Report Marks. SRR 66-8, November 1965. Bob D. Rhea. DDC Accession Number AD 624 609.

The purpose of this study was to determine if any of several grades earned at OCS could be used to predict officer effectiveness as measured by Officer Fitness Report Summaries. The subjects were 2,183 graduates from OCS Classes 34, 35, 36, 39, 40, and 41 (1957-58). The criterion of officer effectiveness was the average fitness report rating received by the officer during his first 18 months of naval service.

Essentially, the conclusions were: (1) there is a low but statistically significant relationship (the average validity was .22) between each of the OCS grades considered in this study and the fitness criterion, (2) Fleet based fitness report marks are significantly less predictable than Shore based fitness reports, (3) the validities of the various OCS academic grades vary only slightly, and (4) Final School Grade and Military Aptitude were the best predictors of those studies, having validities in the .16 to .37 range.

Development of Criteria for Evaluation of Personnel Readiness Afloat: Preliminary Analysis. PRL Report No. WRM 66-21, December 1965. K. W. Gray. DDC Accession Number AD 474 850L.

As a result of the exploratory phase of developing criteria an operationally acceptable technique for evaluation of personnel readiness afloat was prepared. Included are the results of a search of the literature, analysis of related efforts, variables under consideration, development of working definitions, and indications of a general approach to the problem. It is indicated that performance of shipboard duties, including stress conditions, permits collection of data in typical behavior situations and should provide a basis for testing and evaluating proficiency and performance of individuals and groups, thus establishing the essential basis for criterion data in evaluating personnel readiness.

The long range proposal is that a Personnel Readiness Index be constructed to serve the definite purpose of providing an evaluation of personnel readiness factors which can predict combat capabilities.

Navy Personnel Survey 65-1. Special Report No. 1. Officer Procurement and Enlisted Recruitment. December 1965. E. P. Somer. (W)

The semi-annual Navy Personnel Survey 65-1 was conducted during June 1965 to collect data on attitudes and opinions regarding various aspects of Naval Service from a worldwide sample of naval personnel. The sample consisted of 3,600 male officers and 16,000 enlisted men. This report presents an analysis of only those questions dealing with officer procurement and enlisted recruitment.

The incidence of making the decision to seek a Navy career while attending or after college was higher among officers with fewer years of service. Enlisted men generally made their decision to join the Navy while in high school. However, men with more years of service indicated they made their decision earlier in time than men with fewer years of service. Half of the officers and 4 out of 5 of the men who had experience with Navy recruiting service rated it "Good." Both officers and men were in agreement that no one source influenced their decision to join the Navy. However, "Friends in service" was considered one of the most important positive influences. Over half of the officers reported that certain aspects of Navy life were about what they had expected when they first entered the Navy. Over 30% indicated that opportunities for training, education, and advancement were better than anticipated at time of entry. More than half the enlisted men felt that training opportunities, discipline, customs, courtesies, and working hours were what they had expected before enlistment.

Validity of the Advanced Technicians Test in Predicting Performance at Class "B" and "C" Schools. STB 66-15, December 1965. Patricia J. Thomas and Edmund D. Thomas. DDC Accession Number AD 625 119.

The purpose of this research was to evaluate the Advanced Technicians Test (ATT) and several other selection devices for assigning career petty officers to advanced technical training. The ATT, Verbal Analogies Test, and Mechanical Test X-3 were administered experimentally to 1089 students attending twelve Class "B" and "C" service schools. Basic Test Battery scores, length of time in the service, and rate were used, along with the experimental tests, for predicting Final School Grade. Zero-order and multiple correctional analyses determined that most of the experimental tests were highly valid predictors of grades of one or more schools. Operational use of the ATT in selection for advanced technical training is recommended, with minimal modifications in subtest content for various schools. Additional research dealing with use of the mechanical test was recommended.

The Validity of Three Tests for Selecting NROTC Contract Students: CSST, SAT, and NCAT. SRR 66-9, December 1965. Edmund D. Thomas and Patricia J. Thomas. DDC Accession Number AD 626 138.

Candidates to the NROTC Contract Program are selected by the Commanding Officer of each university NROTC unit. Scores on tests of scholastic aptitude are often part of the selection evaluation. This study focused on three such tests which were used in the assessment of applicants for the 1963 Contract NROTC; the Contract Student Selection Test (CSST), Forms 3 and 4, the Scholastic Aptitude Test (SAT), and the 1962 Navy College Aptitude Test (NCAT).

Validities were determined for each of these predictors using two measures of freshman academic achievement, Grade Point Average (GPA) and Naval Science Grade (NSG). Total scores on the three tests were found to be almost equally predictive of both criteria, with validities centering around r=.25. However, when the SAT Total score was separated into the two component scores, SAT-V and SAT-M, SAT-V emerged as a significantly better predictor of both GPA (r=.33) and NSG (r=.34).

It was recommended that, when there are a greater number of applicants than the established quota, and SAT scores are available, those having the highest scores on SAT-V be given preference. When these scores are not available, administration of the CSST was recommended. An equipercentile conversion table was given for transforming scores on the CSST to the SAT-V scale. Because of the annual revision of the NCAT, score distributions and validities fluctuate with each edition, and the use of this test was recommended with reservation.

Geographical Differences in Responses to a Test of Vocational Interests. SRR 66-10, January 1966. Richard R. Stephenson. DDC Accession Number AD 626 612.

The purpose of this study was to test for geographic response bias in a commercial test of vocational interests, the Strong Vocational Interest Blank (SVIB). The SVIB was being evaluated for possible use in the selection of career-oriented officers commissioned through the NROTC (Regular) officer procurement program. To make this geographic evaluation, the continental United States was first divided into six areas according to popular conceptions of geographical regions. A contingency analysis was then performed, analyzing item response differences across geographical areas.

Only six of the 405 SVIB items yielded significant response biases attributable to geographical area of residence. These items were excluded from further consideration in the construction of a career naval officer "occupational" scoring key for the SVIB.

Navy Personnel Survey 65-2, Dependent Overseas Schooling. January 1966. (W)

Opinions of some 1000 officers and enlisted men whose dependents had attended service operated overseas schools are reported. This information was obtained from the semi-annual Navy Personnel Survey 65-2 conducted in December 1965 and January 1966 from a worldwide sample of 6% of commissioned and warrant officers and 3% of enlisted males.

A majority of both officers and enlisted men thought the school last attended by their dependents was adequate. Officers held somewhat less favorable opinions of dependent schools than enlisted men. There were slight differences in the overall opinions of the quality between different service operated dependent schools.

Navy Personnel Survey 65-2, Enlisted Service Schools. January 1966. (W)

These data were collected during December 1965 and January 1966 as part of the semi-annual Navy Personnel Survey 65-2 to ascertain certain attitudes and opinions of naval enlisted men concerning their past experience in Navy operated technical schools (Class A, B and C Schools). The findings are based on the responses of a three (3) percent worldwide sample of enlisted males.

Most of the enlisted men in their overall impression of the "A" school they attended rated it either "Very good" or "Good." A large majority of the men expressed the opinion that a qualified senior Petty Officer makes the most effective teacher in the class "A" schools, a situation which presently exists. The most unfavorable feature, and often the only serious disadvantage of the schools was reported to be the poor study conditions (barracks). A large majority of the men reported they would encourage other men striking for the same rating to attend the same school which they attended.

Installation Commanders' Opinions of Bachelor Housing. January 1966. V. A. Tribble. (W)

The Assistant Secretary of Defense (Manpower) established the requirement for a survey of installation commanders concerning the housing of their male and female bachelor personnel. Commanders of permanent installations in the United States which had a total military population of 1,000 or more officer and enlisted personnel were surveyed. This report contains information from 251 installation commanders representing the Navy, Army, Air Force, and Marine Corps.

The majority of the commanders surveyed were of the opinion that adequate bachelor housing is of considerable importance in achieving mission effectiveness, and that current quarters are inadequate in facilitating the accomplishment of their missions. A third to a half of their bachelor quarters were in an unsatisfactory condition in functional or aesthetic features, and as to furnishings. Installation commanders with a training mission indicated more inadequate bachelor quarters than those with other type missions. The commanders were of the opinion that mission effectiveness would not be impaired if all officers and senior enlisted grades (E-7 through E-9) were permitted to live off the installation.

Reenlistment Differences Among Recruit Companies: A Five Year Follow-Up. SRR 66-15, January 1966. David W. Robertson, LCDR, USN and Bernard Rimland. DDC Accession Number AD 628 869.

This study investigated the possibility that differences in the experiences of recruits of different companies during recruit training might be reflected by significant differences in the recruit's later decision on whether or not to reenlist. Reenlistment percentages of 49 recruit companies convened in February 1960 were computed from the number of these former recruits who had reenlisted by July 1965. A statistical test (chi-square) of the reenlistment percentage differences among companies indicated the differences to be too small to be statistically significant.

It was concluded that intercompany variations,(such as differences in the effectiveness of company commanders) have little, if any, bearing on later reenlistment. It would therefore seem advisable to direct research efforts toward areas which appear to offer more promise of identifying retention-related factors than those which might be supposed to be operative at the recruit company level.

Validation of OCS Selection Instruments: The Relationship of OCS Selection Measures to OCS Performance. STB 66-18, January 1966. Bob D. Rhea. DDC Accession Number AD 635 597.

The purpose of this project was to investigate the relationship of several operational and experimental measures to OCS performance. The subjects were 1,951 graduates from six OCS classes selected in 1957 and 1958. The criteria of school performance were the grades received by the officer candidates during OCS training.

It was concluded that: (1) the best operational selection variables are: the Officer Qualification Test, the first two Quality items on the Officer Inquiry Form (the ability to make logical decisions and the ability to originate and act upon ideas of his own), and the Average College Grade (validities with Final Grade were .50, .26 and .22, respectively); (2) there is little reason to recommend changing the operational Inquiry Form (Form 1751) at this time, since the experimental Inquiry Forms (average validity .20) did not prove to be more valid than some of the Quality Scores on the operational form; and (3) in analyzing combinations of predictor variables it was found that no two-variable combination yielded a useful increase in validity.

The Values of Junior Officers Part I: Importance, Obtainability and Comparability of Various Career Values. SRR 66-11, January 1966. William H. Githens. DDC Accession Number AD 627 213.

This study explored some of the career values of junior officers which may relate to their decisions on whether or not to remain in the Navy. Junior officers who had been commissioned via the NROTC Regular program responded to a questionnaire designed to measure: (1) the *importance* of various aspects of a career, (2) the obtainability of these aspects by a naval career, and (3) the degree to which in each aspect the *Navy* career has the advantage over most likely held civilian jobs. NROTC junior officers as a group were described in terms of these three measurements.

One of the conclusions pointed out that the following aspects were considered important by the junior officers but not readily obtainable in the Navy:

Satisfactory Home Life
Full Use of Abilities
Work Under Consistent and Intelligent Personnel Policies
Feelings of Accomplishment
Success Through Ability Alone

Subsequent research will investigate differences in the above values for officers who do or do not decide to make a career of the Navy.

A Computerized Model of the Fleet Personnel Distribution System. SRR 66-13, February 1966. Robert P. Thorpe and Richard D. Conner. DDC Accession Number AD 633 258.

This report describes the development and operational test of a computerized personnel distribution model designed by this Activity to simulate the distribution functions of the Enlisted Personnel Distribution Office, Pacific Fleet (EPDOPAC). This model consists of a Sort-Match model, which is designed to perform the function of screening personnel made available to the EPDO by BUPERS, and a Quota Determination model, which equitably allocates to the type commands those personnel who are not assigned by the Sort-Match model.

This report also describes other current research of this Activity concerned with personnel assignment, prediction techniques, policy-testing techniques, and personnel rotation. Some description is also presented on long range research plans which include development of a completely integrated all-Navy Personnel Assignment, Distribution, and Rotation Model (PADRO Model), automation of certain other aspects of the distribution and assignment system, development of a fleet personnel data bank, and the design of an information retrieval model.

Development of Reserve Officer Aptitude Test Forms 1 and 2. PRL Report No. WTB 66-2, March 1966. DDC Accession Number AD 479 819.

This report describes the development of two parallel forms of the Reserve Officer Aptitude Test (ROAT Forms 1 and 2) to replace the Reserve Officer Candidate Selection Test (ROCST Forms 3 and 4) and Contract Student Selection Test (CSST Forms 3 and 4) currently used in the selection of applicants for the ROC and NROTC Contract Programs, respectively.

The method used in developing norms and the results of correlational analysis ensure that ROAT Forms 1 and 2 are not only satisfactorily reliable and valid for predicting success in the ROC Program, but sufficiently equivalent in these and other essentials to warrant their operational use interchangeably, in place of ROCST Forms 3 and 4, in the selection of applicants for the ROC Program. In view of this and the similarity in the general ability and educational levels of NROTC Contract applicants to ROC applicants, ROAT Forms 1 and 2 are suitable for operational use, in place of CSST Forms 3 and 4, in the selection of applicants for the NROTC Contract Program.

Development of Criteria for Evaluation of Personnel Readiness Afloat, Briefing and Progress Report. PRL Progress Report, Washington, D. C., April 1966.

This report incorporates accomplishments to date on the long-range goal to develop a personnel readiness system for integration as a subsystem in the total readiness system of the Navy.

Proposed phases for the research are:

a. Develop standards of on-job performance for evaluation of individual levels of readiness.

b. Develop performance evaluation standards for "teams."

c. Develop guidelines for evaluating or determining the condition of personnel readiness of a ship.

d. Determine correlations between recorded personnel data and record of on-job performance.

e. After development of acceptable personnel evaluation standards, in relation to readiness levels, develop a subsystem for integration into the Naval Readiness Analysis System.

Navy Personnel Survey 65-1. Supplemental Report, Officer and Enlsited.
April 1966. E. P. Somer. (W)

Information was obtained from the Navy Personnel Survey 65-1 on the attitudes and opinions of U. S. Naval officers and enlisted men concerning a variety of topics including procurement, recruitment, advancement, reserve intentions, housing/quarters and others. This report descriptively supplements the Navy Personnel Survey 65-1, Basic Report.

Findings reveal one in three of the officers made their decision to seek a Navy commission while in college and reported that no one source influenced their decision to join the Navy. Increased size of individual staterooms, and individual room size were considered to be the two changes that would do most to improve the shipboard quarters and bachelor officer quarters, respectively, by more than one in four of the officers. More than half of the officers felt the Navy promotion opportunities were better when compared with other military services. Of the 1 out of 10 officers who attended USN Justice School, R. I., 70% rated it "Good."

Among the enlisted men, more than four in ten reported making their decision to enlist while in high school and indicated that educational opportunities were better, and choice of assignments worse, than they had expected when they first entered the Navy. More than half felt that Navy advancement opportunities were better than opportunities in other services. More than one-fourth of the enlisted men who indicated they will join a reserve unit when they leave active duty had no obligation to do so. More than half of the men who had experience with the household goods program rated it "Good." More storage space and separate rooms instead of open dormitories were considered the most important features that would improve conditions in shipboard quarters and in barracks.

Necessity/Sufficiency as a Conceptual Model for Predictor-Criterion Relationships.

STB 66-30, April 1966. Ervin W. Curtis.

The concepts of necessity and sufficiency are presented as the basis for understanding various predictor-criterion relationships. Three types of strong relationships are introduced as models for the discovery, utilization, and evaluation of predictors: (1) "necessary-and-sufficient," the conventional symmetrical relationship where the frequencies in two cells of the four-fold table approach zero as the association increases, (2) "necessary-but-not-sufficient," the asymmetrical relationship where the frequency in only the false-positive cell approaches zero, and (3) "sufficient-but-not-necessary," the asymmetrical relationship where the frequency in only the false-negative cell approaches zero.

It is shown that the necessary-and-sufficient model is a poor basis for the discovery, utilization, and validation of necessary-but-not-sufficient and sufficient-but-not-necessary predictors. Due to over-emphasis of the necessary-and-sufficient model, it is likely that many potentially useful predictors have been discarded as useless. An improved methodology is suggested.

Opinions of Military Personnel Concerning Bachelor Housing.

April 1966. H. J. Dupuy. (W)

This study determined conditions of bachelor housing among all Army, Navy, Air Force and Marine Corps personnel (male and female). Responses of some 6,300 officers and 14,500 enlisted personnel to a questionnaire distributed in September, October and November, 1965, are contained in this report. Nearly half of all those surveyed consider their bachelor government quarters unsatisfactory. Converted to population estimates, these percentages reveal that almost one-quarter of a million bachelor military personnel are currently residing in government quarters which they consider unsatisfactory. The quarters are deficient in providing privacy, space, soundproofing, cooling, ventilation, and other facilities, and are frequently overcrowded. Living in unsatisfactory quarters was found to produce an unfavorable effect on job performance and is considered a major factor among bachelor personnel in their career decisions. Very few (5%) living in local civilian housing consider their housing unsatisfactory. A large majority of all personnel except field grade officers prefer civilian housing with many willing to supplement their BAQ with out-of-pocket funds.

Program PROFILE: Manual for Use of Computer in Enlisted Classification. STB 66-27, April 1966. Bruce R. Wood, Carl Schuster, PNC, USN and John Martin, PNSA, USN. DDC Accession Number AD 631 505.

This report describes the operation and use of Program PROFILE, the first part of Project COMPASS, a computer assisted classification and assignment system. Program PROFILE, a FORTRAN computer program, considers test scores, procurement categories, and school requirements in determining a recruit's eligibility for the various Navy service schools. It then generates a list of these schools with appropriate accompanying information, to be made available to the interviewer to help in determining what school assignment the recruit will ultimately receive.

Program SCREEN: Manual for Computer Use in Enlisted Classification Project COMPASS, Part II. STB 66-29, April 1966. Bruce R. Wood, Carl Schuster, PNC, USN and John Martin, PNSA, USN. DDC Accession Number AD 632 741.

This report describes the operation and use of Program SCREEN, the second part of Project COMPASS, a computer assisted classification and assignment system. Program SCREEN, a FORTRAN computer program, reviews a Navy recruit's eligibility for entrance into the various naval schools for which he may have been recommended by an Enlisted Classification Interviewer. It then prints out all errors in such recommendations, thus allowing changes to be made before the assignment process actually takes place.

Aviation Officer Survey. May 1966. J. W. Adams. (W)

Responses of a 3,716 cross-section representative of 19,006 aviation officers to questions regarding various aspects of Naval Service are described in this report. Among the topic areas surveyed are procurement, type training, initial experiences and influences, retention, and career aspirations.

The sample exhibited about the same magnitude of career motivation that was then being demonstrated by known retention rates among Naval Aviation Officers. Among officers planning a Navy career the most important aspects influencing pursuit of a Navy career were reported as "Interesting work" and "Chances for command." The change which would influence the largest number of respondents to pursue a Navy career was reported as "More time at home." A proposed severance pay program appealed particularly to junior Reserve officers. The average sum of money reported as an equitable inducement for an extended contract of five to six years was $19,275. A twenty year "Pilot only" program (which guarantees twenty years service in pilot billets) was met with a generally neutral reaction with regard to its effect on career motivation. Most officers planning to leave active Navy duty feel that although they will initially earn less than their Navy salary, they will surpass Navy earnings in five years. Civilian pilot jobs are a significant attraction to junior pilots who are planning to leave, or are undecided about a Navy career.

Follow-up Comparisons of Three-Year with Four-Year and Minority Enlistees.

PRL Report No. WRM 66-39, May 1966. DDC Accession Number 633 597.

Three-year enlistees were compared with four-year and minority enlistees, all of whom had enlisted in the Navy without prior military service during the first half of 1962 and were on active duty 30 June 1964. All men in the three samples met the BTB test score requirements for at least one Class A school (basic job career training), and the samples were matched on general ability (GCT+ARI+MECH). Comparisons were made as of 30 June 1964--2 to 2 1/2 years after first enlistment--on: (1) Rates of initial assignments to six broad categories of Class A schools and no school, (2) rates of initial assignments, among those assigned to Class A schools, to the six categories of these schools, (3) rate of enlistment extensions for Class A school assignment, (4) rate of reenlistment for assignment to the Selective Training and Retention (STAR) Program, and (5) rate of advancement in pay grade.

Certain of the findings indicate that three-year enlistees were trained somewhat differently than four-year or minority enlistees. Possible implications and the need for further evaluation of these differences are discussed. The small percentage found to have extended their enlistments for Class A school or reenlisted for STAR do not show that three-year enlistees, in general, had much interest in pursuing a naval career. Other findings, however, indicate that a number of advantages accrued to the Navy from their use. These are pointed out.

It is recommended that, should future manpower requirements warrant the initiation of a new three-year enlistment program, the findings be given due consideration in establishing guidelines for such a program.

Navy Personnel Survey 65-2, Basic Report. Officer and Enlisted. May 1966. (W)

Statistical data is presented from the semi-annual Navy Personnel Survey 65-2 which was conducted during December 1965 and January 1966. A worldwide sample of 6% of the commissioned and warrant officers and 3% of the enlisted males answered questions concerning, among others, duty location, dependent schooling, advancement, training, procurement, and retention.

Responses to all questions are displayed by pay grade and Designator/Rating groups.

Navy Personnel Survey 65-1 Supplemental Report, Enlisted WAVE. May 1966. (W)

The Enlisted WAVE Supplemental Report presents data obtained from the Navy Personnel Survey 65-1 conducted in June 1965. Seventy-four percent of all enlisted Waves participated in the survey. Major areas discussed include recruiting, rating satisfaction, advancement and training, housing, recreation, and career motivation.

Findings reveal that a majority of Waves are satisfied with their ratings, are working in the ratings they prefer, and find their jobs worthwhile. A large majority live in barracks, but prefer to live off station and feel that the Navy is not doing enough to improve their living conditions. Only one Wave in five favors a curfew. Seventy percent of the Waves agree they would join the Navy if they had it to do over again. Six in ten would encourage qualified women to enlist. One-third of the women enter the Navy planning to serve only one enlistment, and one-half have no definite plans. By the end of three years, however, three-fourths indicate their intention to leave at the end of their enlistment. Most Waves would not encourage their Wave friends to reenlist. Waves feel that even if an enlisted Wave marries she should complete her enlistment obligation.

Program LOCNEC: Manual for Use of Computer in Enlisted Classification Project COMPASS, Part V. STB 66-32, May 1966. Bruce R. Wood, Carl C. Schuster, PNC, USN, and John D. Martin, PNSA, USN. DDC Accession Number AD 636 540.

This report describes the operation and use of Program LOCNEC, the fifth part of Project COMPASS, a Computer Assisted Classification and Assignment System. Program LOCNEC, a FORTRAN computer program, assigns Naval Enlisted Classification Codes, school class convening dates, and school location codes to those recruits selected for the various naval schools. The logic of Program LOCNEC is incorporated into Program SKOOL, the third part of Project COMPASS. However, if Program OPERATE (Project COMPASS, Part VI) is used to make the school assignment, Program LOCNEC is then necessary, as a separate run, to complete the additional assignment above.

Program SKOOL: Manual for Comptuer Use in Enlisted Classification Project COMPASS, Part III. STB 66-33, May 1966. Bruce R. Wood, Carl C. Schuster, PNC, USN and John D. Martin, PNSA, USN. DDC Accession Number AD 636 539.

This report describes the operation and use of Program SKOOL, the third part of Project COMPASS, a Computer Assisted Classification and Assignment System. Program SKOOL, a FORTRAN computer program, selects and records for each Navy recruit, a naval school, Naval Enlisted Classification Code, calendar week code, and a school location code based on the recruit's qualifications and recommendations received from an Enlisted Classification Interviewer. Program SKOOL then prints out all assignments and, if desired, punches assignment output cards.

Development of the SEAVEY Planning Model. SRR 66-24, June 1966. Richard D. Conner, Burton E. Thompson and R. V. May, Jr.

This report describes the development and application of a computerized model designed by this Activity for use in planning the rotation of enlisted personnel from sea duty to shore duty, referred to as SEAVEY. This model, called the SEAVEY Planning Model, produces strength projections to the end of the SEAVEY period, viz., fourteen months into the future, for planners to use in establishing cut-off dates for each pay grade of each rating. These projections are for total Navy strength, sea strength, and shore strength. A comparison of sea and shore strength and their respective projected allowances leads to a determination of the number of men to be transferred to shore. The number of personnel eligible for rotation to shore by their sea duty commencement date is also projected by the model for use in determining the SEAVEY cut-off date that will allow the number of transfers desired. The SEAVEY model provides all the empirical data necessary to make cut-off date decisions on a single printout for each pay grade of a rating. A rating summary of SEAVEY decision results is also provided for leader and non-leader categories and for petty officers.

Future research in the area of enlisted personnel rotation is also discussed with emphasis on the improvement of the data base on which SEAVEY calculations are made and on developing more accurate projection methodology. Use of the SEAVEY model to test changes in rotation policy is suggested and a study of the interaction of rotation with other personnel management sub-systems is discussed.

Development of the Short Basic Test Battery Form SB-3. PRL Report No. WTB 66-3, June 1966. A. Katz and P. J. Barnes. DDC Accession Number AD 634 595.

This report describes the development of an alternate form (Form SB-3) to the current Forms SB-1 and -2 of the Short Basic Test Battery (SBTB), in which the tests are one-half to two-thirds the length of those in the current form of the Basic Test Battery (BTB).

The method used in developing norms and the results of correlational analysis ensure that the newly-developed tests in

Form SB-3 of the SBTB are sufficiently reliable and predictive of the scores of enlisted applicants on the corresponding tests of the BTB itself. The results further indicated that Form SB-3 tests are sufficiently equivalent to their Forms SB-1 and -2 counterparts in these and other essentials to warrant use of the three SBTB forms, if desired, as interchangeable instruments in the preliminary classification of enlisted applicants.

Procedures for Evaluating Personnel Readiness Afloat. PRL Report No. WRM 66-47, June 1966. K. W. Gray. DDC Accession Number AD 483 949.

To secure acceptable personnel evaluation standards it is necessary to develop a personnel readiness system for ships. The initial phase of the research has encompassed: (1) An investigation into the state of the art, (2) analysis and conferences to determine OPNAV and Fleet positions on readiness standards, (3) modification and addition to working definitions, and (4) refinement of the statement of the problem.

As a result of looking into the field, the hypothesis is advanced that a predictor score of ORI performance can be developed from: (1) quantitative figures by categories such as rate, rating, and NEC; (2) standard record data such as time in rate, time in service, and test battery scores; and (3) time assigned to duty, weighted by criticality. It seems highly probable that a system can be developed which would predict the personnel element of operational performance. The keystone of such a system would be a personnel index or predictor score for performance in operational functions.

The Ralationship of Reading Ability to Acheivement in an Experimental Electronics Technician School. SRM 66-37, June 1966. Eugene A. Hooprich. DDC Accession Number AD 634 838.

An investigation was conducted to determine the relationship between reading ability and achievement in the experimental Electronics Technician (ET) School conducted by the Navy Training Research Laboratory, San Diego. The sample (N=75) consisted of members of five experimental ET School classes trained between September 1964 and May 1966. The experimental training course was oriented toward proficiency in maintenance performance, and trainees were selected from among Navy recruits who had aptitude scores slightly below those required for selection to ET "S" Schools. The achievement criteria were composite scores (written and performance) based on trainees' scores on all tests administered throughout the course. Product-moment correlations were computed between two reading test scores and the training achievement scores. No statistically significant correlations were obtained. Results indicate that, for technical training courses with orientation and approach similar to the experimental ET School, reading ability within the range of the present sample is not a critical factor in determining success in training.

SEAVEY Planning Model Projections for Segment C 1966. SRM 66-42, June 1966.

This machine printout presents the results of the first operational application of the SEAVEY Planning Model (described in SRR 66-24). It was prepared specifically for the Enlisted Personnel Division of BUPERS for establishing cut-off dates for Segment C of the 1966 SEAVEY.

For each of the over 400 rates covered by this report, two key types of data are presented. The first is a projection of the number of men that are eligible to go ashore for every possible sea duty commencement date at which the SEAVEY cut-off date can be set. The second is the resultant sea and shore manning which would occur in the future as a result of setting the cut-off at each feasible date. Thus, this report serves as a management decision document in that it provides the planner with every decision alternative available to him and the projected results of each of these alternatives. (See: Development of the SEAVEY Planning Model, SRR 66-24, June 1966.)

An Eight-Year Follow-Up of NROTC Applicants' Statements of Career Intentions. SRM 67-2, August 1966. William H. Githens and Bernard Rimland. DDC Accession Number AD 638 605.

NROTC officers (N=776) who had been asked in 1956, as NROTC applicants, to state their interest in a Navy career were followed up in 1964 to determine if the earlier statements were valid. Of those indicating positive career intent, 46 percent were still on active duty six months after initial obligated service. Of those indicating negative motivation for a naval career, only 37 percent were still on active duty. Recommendations for using this information in future NROTC selection procedures are made.

An Evaluation of a Short Form of the Radio Code Aptitude Test. SRR 67-2, August 1966. Bernard Rimland. DDC Accession Number AD 639 224.

The Radio Code Aptitude Test (RCAT) has been used during and since WWII in the selection of personnel for Morse Code training. As a result of recent criticism that the test was too highly speeded toward the end, and was thus hopelessly outpacing and demotivating the testees, an analysis was made of the feasibility of eliminating most of the fast-paced latter items of the RCAT.

Statistical analysis of a sample of completed RCAT answer sheets showed the final sixty items (40 percent) of the RCAT could be eliminated with no loss in psychometric efficiency. The short (60 percent) form correlated .96 with the long form, and each form had a reliability of .95. Since most items unanswered by the testees were found to have occurred in the final, highly-speeded 40 percent of the test, it may be assumed that testee frustration will be greatly reduced by the shortened RCAT.

It is recommended that items 166 through 225 be omitted from future testing with the Radio Code Aptitude Test. A conversion table for obtaining Navy Standard Scores from the new short form RCAT is provided as an appendix to this report.

Reserve Aviator Survey 1966. August 1966. E. J. McGowan. (W)

The purpose of this study was to determine how many naval aviators released to inactive duty since 1961 with a rank of Lieutenant Commander or lower were employed with the commercial airlines, either presently or at some time in the past. Surveys were mailed in June 1966 to 1,895 reserve aviators who separated from active duty after 1961 with the rank of Lieutenant Commander or lower, and who were on the Reserve Tape files as of June, 1966.

Of the reserve aviators surveyed, 50% are presently airline pilots. Of these pilots; 71% became airline pilots at separation, 98% intend to remain with their present employer until retirement, and 90% estimate they will be making over $25,000 in fifteen years.

Almost half of the respondents chose deprivation of home life as the main reason for leaving the Navy. A larger percentage of those who are now airline pilots than others specify little financial opportunity in the Navy. Eighty-three percent consider their retirement plan better than the Navy's, compared to less than a fourth among other groups. Ninety-eight percent would still leave the service if given the choice again, and 88% have never considered returning. If called back, or voluntarily returned, 87% would leave as soon as the obligation was fulfilled. Over half would not return for any amount of money.

Validation of the 1963 Navy College Aptitude Test. STB 67-4, August 1966. Edmund D. Thomas and Patricia J. Thomas. DDC Accession Number AD 638 680.

This study of the validity of the 1963 Navy College Aptitude Test (NCAT) and of other academic predictors was based on a sample of 1,307 freshmen enrolled in the 1964-65 NROTC Regular program. The NCAT Selection Score yielded corrected correlations of .24 with Grade Point Average (GPA) and .14 with Naval Science Grade (NSG). The High School Rating (HSR) continued to be the most valid single predictor of college performance, producing corrected correlations of .46 with GPA and .31 with NSG. When HSR was combined with the NCAT, the validity was increased to .48 with GPA but no increment was noted for NSG.

A comparison of the 1963 NCAT with the SAT indicated the former to be slightly more valid. Neither test demonstrated significant differential prediction between groups dichotimized by technical and non-technical college majors.

The rate of attrition for this midshipmen sample was 15 percent, compared to the national rate for male freshmen of 30 percent. From these figures it was estimated that the reduction in freshmen dropouts saved the Navy at least $424,600 in Fiscal Year 1966.

Results of the present report were consistent with the findings of the two immediately preceding studies. Recommended changes in NCAT subtests and item validation have already been implemented. Future research should make use of newly available statistical programs and advanced electronic test-processing equipment.

Naval Knowledge as a Predictor of Service Tenure Among NROTC Officers. SRR 67-5, September 1966. William H. Githens, Idell Neumann and Norman M. Abrahams. DDC Accession Number AD 640 067.

The scores on a 30-item Naval Knowledge Test (NKT) administered to NROTC applicants in 1956 were validated in 1966 against the service tenure of 765 officers who had been accepted into the NROTC program and commissioned.

In addition to being evaluated as a single predictor, the NKT was examined for useful interrelationships with two other predictors: (1) the Naval College Aptitude Test (NCAT), and (2) the applicant's response to a question regarding career intention (CQ).

The validity of the NKT reached a useful level, but fell short of statistical significance. In view of its lack of statistical significance, and since other significantly valid predictors are now available, use of the NROTC selection is not recommended.

Navy Personnel Survey 65-1. Supplemental Report on Retention. September 1966. E. P. Somer. (W)

The Officer and Enlisted Retention Report is a supplemental report to the Navy Personnel Survey 65-1, Basic Report. Information presented herein provides an analysis of the attitudes concerning retention of enlisted men in their first enlistment and male officers with 4 years or less of service. A worldwide sample of 5% of commissioned and warrant officers and 3% of enlisted males participated in this survey in June 1965.

Limited home life, poor utilization of abilities, and low pay were considered to be the most important reasons officers gave for leaving the Navy after their initial tour of obligated service. Career motivated officers consistently rated such aspects as promotion opportunities, prestige of Navy career, opportunities for choosing assignments, and opportunities for attending schools, more favorably than non-career oriented officers. Career motivated officers as compared to non-career motivated officers, when first entering the Navy, held higher opinions of these aspects of Navy life, rated most features of Navy life better than civilian life, were more satisfied with the Officer Fitness Reporting System, and made their decision to seek a Navy commission before entering college.

Among the first term enlisted personnel low pay and limited home life were the most important reasons for leaving the Navy. The one change most frequently selected to make the Navy more attractive was an increase in pay and allowances. About half of the career motivated men felt that freedom of personal life in the Navy, and freedom to do the job the way the man thinks is best was worse in the Navy than in civilian life. More than 10% of the first enlistees who plan to leave after their current enlistment indicated they would reenlist if any one of three proposed changes in the Pro-Pay Program were instituted.

The Strong Vocational Interest Blank Keyed to Predict NROTC Officer Retention.

SRR 67-4, September 1966. Norman M. Abrahams, Idell Neumann and Bernard Rimland.

The 1964 revision of the Strong Vocational Interest Blank (SVIB) was administered to 1,900 Naval Reserve Officer Training Corps (NROTC) officers on active duty in 1964. In 1966 the responses of officers who had served 4-6 years beyond obligated duty were compared with those of officers who left the service within six months after completing their obligation. A naval officer retention key was developed by selecting the responses with a percent difference of 10 or greater. This key provided excellent separation on the criterion samples and its validity, though reduced, remained high on cross-validation samples. Its use in the NROTC selection program is recommended.

Career-Related Values of Designated Naval Aviators and Naval Flight Officers.

SRR 67-6, October 1966. LCDR David W. Robertson, USN. DDC Accession Number AD 643 440.

A survey of naval aviators and flight officers in Naval Air Force ships and squadrons was conducted to investigate the influence of various job values and possible policy changes on career motivation. The two populations studied were: those officers with at least 18 months since designation or 3 years active duty since commissioned; and those officers previously within this experience range who had been released to civilian life within the past 6-18 months.

In addition to the general, Navy-wide dissatisfaction with family separation and long working hours, the most critical influences on retention of this particular aviation community were found to be: the enormous attraction of an airline pilot career, Type squadron assigned, Preference for a "strictly Pilot/Flight Officer" career (as contrasted with the conventional unrestricted line officer career), Command opportunity for the Naval Flight Officer, and effective officer career counseling.

The least critical influences on retention were found to be: methods of awarding medals, and personal risk as it pertains to combat or aircraft carrier operations.

The most favorable responses were to the following possible career-incentive policy changes: choice of type squadron, maximum of 6 months away from home port, cash bonuses for additional years of active duty, and personnel interviews prior to issuing change of duty orders. The least favorable responses were to: accelerated promotion to LCDR, cash bonuses while flying from aircraft carriers, and family assistance centers.

An Empirical Navy Activities Preference Blank Scale to Predict Class "A" School Achievement. SRM 67-7, October 1966. Norman M. Abrahams, William H. Githens and Idell Neumann. DDC Accession Number, AD 640 652.

This report describes construction of an NAPB Achievement Scale designed to improve prediction of Navy "A" school performance. The achievement criterion was obtained by classifying men as "high achievers" whose actual school performance markedly surpassed that predicted by BTB tests, and by classifying as "low achievers" those whose actual performance fell markedly below the predicted level. A multiple regression analysis of the high and low achievers identified the single responses and response configurations on the NAPB which were significantly related to this "achievement" variable.

The total sample of high, average, and low achievers was then scored on the NAPB Achievement Scale and their school grades were related to this score both (1) alone, and, (2) in combination with BTB. In addition, possible moderator effects of the "achievement" score and GCT scores were examined. In general, validities were negligible and cross-validation did not seem warranted.

Program OPERATE: Manual for Use of Computer in Enlisted Classification. Project COMPASS, Part VI. STB 67-7, October 1966. Bruce R. Wood, Carl C. Schuster, PNC, USN and John D. Martin, PNSA, USN. DDC Accession Number, AD 640 827.

This report describes the operation and use of Program OPERATE, the sixth part of Project COMPASS, a Computer Assisted Classification and Assignment System. Program OPERATE and its necessary accompanying parts are FORTRAN Computer programs and sub-routines. Program OPERATE selects and assigns to a naval recruit, if possible, a naval school. Selection is done by means of a modified version of the transportation algorithm applied to test battery scores. The program then punches out an assignment card. It is to be used in conjunction with Program LOCNEC, Technical Bulletin STB 66-32, which completes the assignment process by assigning a Navy Enlisted Classification Code, a calendar week code, and a school location code.

SEAVEY Planning Model Projections for Segment A 1967. SRM 67-9, October 1966. R. D. Conner and T. B. Quisenberry, PNC, USN.

Under the direction of the Chief of Naval Personnel, this Activity is conducting continuing research in the area of enlisted personnel rotation. One of the end products of this research to date is a computerized model, the SEAVEY Planning Model, which presents information designed to assist in the selection of the most appropriate "cut-off dates."

This report contains the results of the application of the SEAVEY Planning Model to data for SEAVEY A 1967. These results were prepared specifically for internal use by the Enlisted Personnel Division (Pers-B2) of BUPERS to establish cut-off dates.

SEQUIN: A Computerized Item Selection Procedure. SRM 67-8, October 1966. William J. Moonan and CPL Udo W. Pooch, USMC. DDC Accession Number AD 641 813.

This report describes a computerized item selection program called SEQUIN. This program can be used to determine if the number of items of a test can be reduced without practically reducing certain desirable psychometric properties of the test such as validity and internal consistency reliability. Applications of this program indicate that, in certain cases, the number of items can be substantially reduced with an increase in validity. This means then it is potentially very profitable to use such procedures as SEQUIN to analyze tests and testing programs.

Development of Criteria for Evaluation of Personnel Readiness Afloat. PRL Staff Paper, Unnumbered, November 1966. N. E. Dozier and R. L. Black. (W)

This research concerns development of a personnel readiness index or predictor score, which would predict the personnel element of operational performance.

Analysis indicates that: (1) the overall combat readiness of our naval forces is determined by people. A gross determination of how well these people perform under combat conditions can best be determined by how well these people perform under standardized exercises which attempt to stimulate combat conditions; (2) there are numerous variables both on the people side and on the exercise (performance) side. Some of these variables can be measured; some cannot. Those variables having the largest amount of face validity have been isolated. Provision must be made to incorporate subjective evaluation by senior officers in the chain of command to compensate for some of the important variables that seemingly are incapable of even gross measurement.

Regular Officer Resignee Survey. November 1966. E. J. McGowan and H. J. Dupuy. (W)

This study was designed to aid in answering, among others, the following basic questions about the officer resignee:

Why did he resign?
What have been his civilian experiences?
Is he satisfied with his decision?

Also discussed are the resignees' background, how they felt about particular aspects of military and civilian life, and what effect rank and/or designator at the time of resignation had on their attitudes and experiences. Survey questionnaires mailed in September 1965 were returned by 1,638 naval officers who had voluntarily resigned between 1 July 1959 and 30 June 1964, with the rank of Lieutenant Commander or below.

In general, the resignees were undecided about a Navy career at entry into the Navy. They applied for a commission primarily for a subsidized education, were interested in the sea, or yearned for travel and adventure. Excessive sea duty, challenge and opportunities of civilian competition, and the desire to work at a particular job, occupation or profession for which civilian life offered the most appropriate opportunity, were the most frequently given reasons for resigning.

Generally, respondents started working at a full time position within a month after separation and were employed in the capacity of a "Professional, technical or operations officer," "Company representative" or "Supervisor." They felt their financial needs were well met. They had earned more in their civilian jobs then they would have if they had remained in the Navy. Resignees rated medical care and fringe benefits as better in the Navy; they rated freedom of action, self development, and family life better in civilian life.

About 9 in 10 indicated none of a list of changes would influence them to return to Navy life. Most would not return voluntarily, and, other then holding membership in the Naval Reserve, they maintain little association with the Navy. Most officers in this survey were well satisfied in their civilian positions, and term their reasons for resignation as "Pro-civilian" rather than "Anti-Navy." An increase in pay and allowances alone, even up to 50% would not have been enough of an incentive to have kept more than 4 in 10 from resigning. Considerable effort was made in furthering educational goals after returning to civilian life, and many have earned advanced degrees. Current annual civilian income is approximately $500-$700 greater than Navy pay would have been for 1100's (unrestricted line officers-surface) and approximately $1,500 a year lower than Navy income of 1300's (aviation officers) if they had remained in the service.

Studies in the Computerization of Enlisted Classification: I. A Hierarchy of Criteria for Computerized Classification of Enlisted Men. Bernard Rimland. II. Training Cost Minimization as a Criterion for Personnel Classification. Edward F. Alf, Jr. III. Short-term Fluctuations in Class "A" School Quotas. Leonard Swanson. SRM 67-10, November 1966

This report consists of three brief papers presenting several aspects of the ongoing research program at the U. S. Naval Personnel Research Activity, San Diego, concerned with computerizing enlisted classification.

The first paper provides an overview of planned and alternative approaches to a central issue in computerized classification, namely; what are the goals the computer will maximize?

The second paper presents the mathematics behind one goal currently being investigated--cost reduction, as measured in dollars spent in training. The results of a small scale simulation study are reported.

The third paper emphasizes the need for computerization by showing how fluctuations in short-term demand can create brief and expensive periods of "feast or famine" in the available manpower pool even when the longer-term manpower supply may be stable and adequate.

Validation of the Dial and Table Reading Test and Pattern Comprehension Test. STB 67-14, December 1966. Leonard Swanson.

A Dial and Table Reading Test and a Pattern Comprehension Test, both of which were developed and used by the Air Force for enlisted classification, were validated against school grades in 12 Navy Class "A" schools. The schools were chosen to represent a cross section of Navy training. The new tests did not add sufficient validity to the Navy Basic Battery now used for selection for the schools to warrant adoption.

Validation of Selection Procedures for the Navy Enlisted Scientific Education Program: I. Preliminary Report. PRL Report No. WRM 67-12, November 1966. DDC Accession Number AD 642 111.

This is the first in a series of studies to assess and improve current procedures for selecting applicants for accelerated four year college curricula under the Navy Enlisted Scientific Education Program (NESEP).

Using freshman grade-point average as the criterion, validation of the current Selection Composite and its nine Acedemic and four Leadership and Performance components were performed in an unrestricted sample of NESEP applicants (N=880). In these analyses, validity coefficients in a restricted sample comprised of selectees (N-195) were corrected for direct or incidental restriction in range (as appropriate) resulting from explicit selection of the Selection Composite. Because the College Board Scholastic Aptitude Test (SAT) will be substituted for the NESEP Screening Examination in the composite for future selection, additional correlational and regression analyses were performed to estimate the effects of this change. Findings indicate that: (1) the validity of the current Selection Composite is fairly satisfactory (r=45), but needs some improvement; (2) a potentially more useful composite of four optimally-weighted Academic predictors shows promise--R=55, subject to shrinkage when cross-validated--of providing an administratively simpler and more valid selector; and (3) the substitution of SAT for the NESEP Screening Examination will probably have little or no effect on the efficiency of NESEP selection procedures.

Item Response Characteristics in Attitude and Personality Measurement; A Reaction to L. G. Rorer's "The Great Response-Style Myth". STB 67-16, January 1967. Edward A. Rundquist. DDC Accession Number AD 646 772.

However defined, response style is not a myth. Responses to personality items are the result of, among other things: (a) item content, (b) social desirability of this content, (c) form in which this content is stated, proportion of each form of statement in an inventory, (d) the desire to dissimulate with respect to the content, and (e) response style. Responses to form of statement--reversed items--conform perfectly to 1 definition of response bias. The differences in correlational and other characteristics of sets of reversed items are a major cause for the confounding and confusion in the interpretation of studies of social desirability and acquiescence. The great need is for external validation studies in relation to the factors that influence personality item responses.

Necessity/Sufficiency as a Conceptual Model for Predictor-Criterion Relationships. STB 67-17, January 1967. Ervin W. Curtis.

The concepts of necessity and sufficiency are presented as the basis for understanding various predictor-criterion relationships. Three types of strong relationships are introduced as models for the discovery, utilization, and evaluation of predictors: (1) "necessary-and-sufficient," the conventional symmetrical relationship where the frequencies in two cells of the four-fold table approach zero as the association increases, (2) "necessary-but-not-sufficient," the asymmetrical relationship were the frequency is only the false-positive cell approaches zero, and (2) "sufficient-but-not-necessary," the asymmetrical relationship where the frequency is only the false-negative cell approaches zero.

It is shown that the necessary-and-sufficient model is a poor basis for the discovery, utilization, and validation of necessary-but-not-sufficient and sufficient-but-not-necessary predictors. Due to over-emphasis of the necessary-and-sufficient model, it is likely that many potentially useful predictors have been discarded as useless. An improved methodology is suggested.

A Preliminary Study of the Paperwork of Technical Ratings Aboard Destroyers. SRR 67-12, January 1967. Norman I. Borgen, Joe Silverman and R. V. May, Jr. DDC Accession Number AD 812 997.

This report presents a detailed description of the paperwork practices of shipboard enlisted personnel in 12 technical ratings aboard eight destroyers and analyzes the scope and variability of such paperwork. This study was undertaken as a result of continuing concern over the possibility that technically-trained personnel were spending a considerable portion of their time on paperwork not directly essential to the performance of the technical duties of the rating.

The results of this study indicate that the time devoted to paperwork averaged 3.3 hours per week per man and that over 75% of this paperwork required some degree of technical knowledge associated with the rating. This suggests a practical limitation upon achieving appreciable savings in time by reducing the non-technical paperwork. The results also reveal great variability in the paperwork practices within the organizational groups studied, both in terms of time expended and specific forms used. The most consistent findings indicate that the higher pay grades have a disproportionately heavy paperwork workload, in relation to their numbers, and that E-4's generally have a relatively small paperwork workload.

Sufficient details on the techniques used in this research are presented so as to enable individual ships to employ this method to determine the extent of their paperwork workload and its allocation among ratings, pay grades, work groups, etc., and then to institute their own corrective measures.

The Application of Decision Theory and Scaling Methods to Selection Test Evaluation. STB 67-18, February 1967. Ervin W. Curtis.

The conventional approach to test evaluation, namely correlation analysis, ignores three important situational factors:

how well the institution could do by chance (commonly called the "base rate"), the proportion to be selected from the population (the selection ratio), and the institutional gains and losses resulting from correct decisions and incorrect decisions.

A method based on statistic decision theory was developed that handles these factors explicitly and systematically.

Also presented is a method which involves the comparison of criterion groups, e.g., satisfactory and unsatisfactory, in terms of their utility to the institution using the selection test.

The three methods (correlational, decision-theoretic, and utility function) were compared through tests used to select students for technical schools in the U. S. Navy. The methods led to quite different indications regarding the utility of the selection tests evaluated. The decision-theoretic and utility function methods agreed in terms of the proportion improvement over chance prediction provided by the tests, while the correlational method tended to underestimate this proportion. In terms of utility, the decision-theoretic method indicated the tests to be worth much more to the Navy than did the other two methods.

The following conclusions were also stated: (1) Statistical decision theory is well suited to the usual selection testing situation; (2) Psychological scaling methods provide a solution for the measurement of values required in the application of the decision-theoretic approach to test evaluation; and (3) Supplementation of correlational analysis of tests with decision-theoretic analysis is likely to lead to new insights into the utility and use of tests for personnel decisions.

Naval Aviator Survey. Flight Trainees 1967. March 1967. S. B. Ware. (W)

A questionnaire was administered to all available flight trainees in various stages of training at Pensacola, Florida and Corpus Christi, Texas (N=1,638). Information was gained concerning career plans of the trainees, both at the time of application for flight training and at the time of the survey. Of primary importance was information gained concerning probable changes in trainees' attitudes toward naval service if several suggested policies, which would seem to exert a positive influence on aviator retention, were put into effect.

Roughly six in ten were undecided toward a Navy career, both at application for flight training and at the time of the survey. One in four at both stages intended to continue naval service beyond their obligation.

The response to several suggested programs and policy changes was found to be favorable. If the present obligation of the surveyed flight trainees were increased by one year, the majority would accept it rather than leaving the Navy or transferring to another Navy program. Had they been offered flight training with one year less obligation by another service, most still would have signed with the Navy. One-half of the trainees would have accepted one or more additional years of obligation at the time of their application for flight training. The majority (75%) of all trainees said they would aspire to be naval aviators even if no flight pay were involved. If offered a Regular commission at the time of the survey, fifty percent of the Reserves would extend their obligation for one or more years. For a $5,000/year bonus, one-third of the Reserves and half of the Regulars would extend their obligated service for four years. If given the opportunity to contract with the Navy for an additional five years of service with the option of either applying for augmentation in the Regular Navy, or being released to inactive duty with a cash bonus, more than one-half of the Reserve trainees would be influenced to stay. One in four trainees would be willing to extend their obligation for one year if given a choice of duty location in the last year of their obligation.

Prediction of Foreign Language Achievement Among Officer and Enlisted Personnel. SRR 67-14, March 1967. Idell Neumann, Norman M. Abrahams and William Githens.

This report presents the results of one phase in the analysis of an experimental selection test battery designed to predict the performance of military personnel in foreign language training. Analyses are provided on the effectiveness of previously constructed predictors of language student performance, including the Foreign Language Aptitude Test (FLAT). Available predictors appear capable of markedly improving student selection for a large variety of Indo-European (Western), Indo-European (Eastern), and Indo-Chinese languages.

The final report, based on analyses of the complete prediction battery, will include specific reommendations for student selection.

Quantification of Personnel Performance for Cost Effectiveness Decisions: I. An Annotated Bibliography. SRM 67-15, April 1967. Joe E. Willis and Andrew N. Dow. DDC Accession Number AD 650 933.

As the first phase of a project to develop a method of predicting personnel performance effectiveness, a search of the literature was made. Quotas, notes, and comments for the use of the research team were made for each article. From the materials assembled, 115 items were selected for an annotated bibliography covering five areas: (1) Personnel performance effectiveness measurement, (2) Personnel performance effectiveness prediction, (3) Human reliability in systems, (4) Personnel performance data utilization problems, and (5) Function allocation. An address list of the sources of publications is included as Appendix A.

Retention in the Navy of Three-Year Enlistees. PRL Report No. WRM 67-40, May 1967. A. Katz and L. H. Sharp. DDC Accession Number AD 651 579.

Three-year enlistees were compared with four-year and minority enlistees, all three groups consisting of males who had enlisted in the Navy without prior military service between 1 January and 30 June 1962, and who were on active duty as of 30 June 1964. The men in the three samples were each eligible for assignment to at least one Class "A" School on the basis of prerequisite BTB Scores, and the three samples were matched on general ability (GCT+ARI+MECH). Comparisons on enlistment status (no longer in service, extension of first enlistment, etc.) were made as of 31 December 1966, four and one-half to five years after dates of initial enlistments.

The principal findings are that in general three-year enlistees had either extended their initial enlistments or signed up for second enlistments to a lesser extent than four-year or minority enlistees. While less percentage-wise, these three-year enlistees added substantially to the Navy's supply of career-oriented enlisted men. Other advantages which occurred to the Navy from the use of three-year enlistees are also pointed out.

It is recommended that, should future manpower requirements warrant the initiation of a new three-year enlistment program, the findings of this study and previous studies in this series be given due consideration in establishing guidelines for such a program.

SEAVEY Planning Model Documents for Segment B 1967. SRM 67-21, May 1967. No author.

This report consists of a computer printout of certain mathematical computations required in the SEAVEY planning process. It is designed for internal use by the Distribution Branch (Pers-B21) of BUPERS as part of a continuing research effort by this Activity to design computer models to reduce the time, effort, and manpower required in the management of enlisted personnel.

Comparisons of Navy Draftees and Enlistees. PRL Report No. WRM 67-57, June 1967. A. Katz. DDC Accession Number AD 656 580.

Draftees and enlistees in the USN, all of whom had come into the Navy in October 1967 without prior military service, were compared as of 30 June 1966 on thirteen variables (primary and secondary dependency, citizenship, year of birth, BTB and special test scores, and rate).

Draftees were found to have included a significantly higher percentage than enlistees with primary and secondary dependents, and a significantly larger percentage of immigrant aliens who had declared their intention of becoming citizens. Draftees also were significantly older than enlistees, but had not achieved as high a rate (pay grade) as enlistees. Draftees had received lower test scores than enlistees; the differences between all but two of the eight tests (Clerical and Electronics Technician Selection Tests) were statistically significant.

All of the statistically significant differences between draftees and enlistees, except for perhaps primary dependency, were of such small magnitude as to be of little or no practical significance.

Summarization of Procurement, Recruitment, and Retention. June 1967. D. B. Churchman. (W)

This report draws together the salient findings concerning officer procurement, enlisted recruitment, and retention from the first three Naval Personnel Surveys. These surveys were conducted in 1964, 1965 and 1966 and cover approximately 12,000 officers and 50,000 enlisted men. These are representative of all Navy personnel.

Most officers with less than 10 years of service made their original decision to enter the Navy during or after college. Friends in service and family were the greatest personal motivating forces to enter the Navy. "Increased pay and allowances" was chosen by one-third of the officers as the most needed single change to make the Navy more attractive. Career motivated officers rated "Promotion opportunities," Prestige of a Navy career," and "Opportunities for choosing assignments" consistently higher than non-career motivated officers as favorable aspects of Navy life. Both groups were in fairly close agreement on viewing negatively such aspects as "Pay and allowances," "Length of working hours," "Homeport time," and fringe or dependent benefits in general.

Among enlisted men, families and friends in service were reported most frequently as the primary sources influencing their decision to enlist. They preponderantly chose "Advanced educational, professional or technical training," and "Travel, adventure, new experiences" as the most important reasons for initially joining the Navy. The most favorable features of Navy life, as identified by enlisted men, were "Steady, secure income" and Retirement and survivors' benefits." The most unfavorable features were "Amount of sea duty" and "Freedom of personal life." When asked to identify one change that would make the Navy more attractive, "Increased pay and allowances" was the most frequent response.

Enlisted men on their first enlistment are largely non-career motivated. About 7 in 10 did not intend to reenlist, 2 in 10 were undecided, and about 1 in 10 indicated they planned to reenlist.

Commissaryman Survey. July 1967. July 1967. E. P. Somer. (W)

This study was conducted to assess the opinions and attitudes of Commissarymen in pay grades E-3 to E-9 on a proposed change of their rating title of "Commissaryman" to "Food Serviceman." All available (129) rated Commissarymen and strikers (those in training for the rating) stationed on board the USS Independence CVA-62, USS Orion AS-18, USS Sierra AD-18 and Naval Air Station Norfolk were surveyed in June 1967.

The results indicated that while proposed rating title of Food Serviceman was felt to be more descriptive of the work actually performed, the rating title of Commissaryman was considered to be more prestigious and was preferred, particularly among men who were Navy career-oriented.

The Navy Activities Preference Blank as a Predictor of Reenlistment.

STB 68-1, July 1967. Norman M. Abrahams, Idell Neumann and William H. Githens.

The low retention rate of enlisted men remains a major problem to the Navy. The purpose of this research is to evaluate an interest test, the Navy Activities Preference Blank (NAPB), as a predictor of retention for use in selection and classification.

Previous attempts to relate the NAPB to retention had used the original theoretically derived scales. The present study employed newly constructed empirical keys specifically designed to predict retention. Several new methods of using the original keys were also investigated.

Retention information obtained from personnel records was used to classify samples of mechanical (N=1119) and electrical-electronic school graduates (N=2914) into non-reenlistees of first-term reenlistees. Item-analyses contrasting these low- and high-criterion samples were used to construct two empirical keys, one for the mechanical and one for the electrical-electronic sample. In a further phase of the study, NAPB scales previously constructed through factor analyses were tried, using the General Classification Test (GCT) as a moderator variable. An attempt was also made to predict reenlistment through the analysis of the pattern of highest and lowest factorially-derived scores.

When applied to cross-validation samples, the empirically derived keys did not predict retention. Both analyses involving the original scales similarly provided no usable prediction of retention.

On the basis of these results, it was concluded that NAPB scales are not promising predictors of retention. Possible reasons for this lack of positive results were advanced and suggestions for further attempts to predict retention, using a different type of vocational interest test, were made.

NORMIX: Computational Methods for Estimating the Parameters of Multivariate Normal Mixtures of Distributions.

SRM 68-2, August 1967. John H. Wolfe. DDC Accession Number AD 656 588.

Procedures are described for estimating the means, covariances, and mixing proportions of a mixture of multivariate-normal distributions. First, it is shown that the maximum-likelihood estimates must satisfy a certain set of simultaneous equations. Then, the coefficients necessary for a complete Newton-Raphson iterative solution of the equations are presented. Since these coefficients are rather complicated, a simpler and more intuitively-appealing iterative method is presented and partially justified on the basis that the two iterative methods are approximately the same when the component distributions are well separated. The formulas for the simplified iteration involve the familiar statistics of sums and sums of squares and cross-products with the modification that each sample value is weighted by its relative likelihood of membership in the type whose parameters are being estimated. Since the estimation procedure is basically maximum-likelihood, tests of hypotheses on the number of component distributions can be developed using likelihood ratios. The computational feasibility of the iteration methods is demonstrated in an example in which a computer program to perform the iterations was run on an artificially constructed mixture of three bivariate normal distributions. A discussion of potential applications indicates that the method has promise in the fields of personality typology, social class analysis, biological taxonomy, information retrieval, and artificial intelligence.

The Development of the U. S. Navy Background Questionnaire for NROTC (Regular) Selection. SRR 68-3, August 1967. Idell Neumann, William H. Githens and Norman M. Abrahams.

The purpose of this project was to develop an instrument useful in selecting NROTC (Regular) students with maximum likelihood of ultimately choosing a naval career. The new test would supplement the interviews and the tests of aptitude and interest now used.

Two earlier NROTC selection instruments, Forms 1 and 2 of the NROTC (Regular) Questionnaire, had been constructed and administered in 1956-1958 to applicants for NROTC scholarships for whom criterion information (career decision) recently became available. Forms 1 and 2 were used as an item pool for development of the new instrument.

The above forms were analyzed and the questions showing the greatest effectiveness in predicting career choice over an eight-year period were identified and assembled into a new instrument, the U. S. Navy Background Questionnaire. Several experimental scoring keys were constructed and cross-validated on a group of subjects not included in the original item analysis.

Analysis of the data indicated the new form to have sufficient predictive validity to warrant its use in the NROTC selection program. As more information on the career choice of NROTC students tested during 1957-1963 becomes available, refinement of the U. S. Navy Background Questionnaire will be possible and is planned.

An Evaluation of Selected Criteria for Measurement of Personnel Readiness. WRM 68-1, August 1967. N. E. Dozier and R. L. Black. DDC Accession Number AD 659 472.

This Research Memorandum is a follow-up to the planned approach as outlined in a previous report and describes the results of correlation studies of the personnel situation aboard various Atlantic Fleet ships.

It was found that little correlation appears to exist between the personnel situation aboard ship (as related to the personnel variables used in this study) and ship performance. Some ships with high quantitative/qualitative personnel levels received much lower scores in ORI/ORE competition relative to ships with lower quantitative/qualitative personnel levels. It became apparent that a reevaluation of the criteria used in this study is necessary. Also, it may be necessary to apply additional personnel criteria and to use the statistics of a greater number of ships in the study.

Fleet Ballistic Missile Weapons System Statistics: Manning Status and Trainee Averages. WSS 68-20, September 1967.

Summarized within this report are the following: Manning Status on board 41 SSB(N)'s and 5 Tenders (AS); Comparisons between allowances and personnel on board for instructors at Fleet Ballistic Missile Weapons System training activities; statistics for students entering into training at the FBM Department Guided Missile School, Dam Neck, Virginia between 1 March and 1 June 1967; and overall Navy allowances, distribution and inventories of FBM Weapons System personnel.

Further Development and Implementation of the SEAVEY Planning Model. SRR 68-4, September 1967. Norman I. Borgen and Robert P. Thorpe. DDC Accession Number AD 661 220.

This report describes the further development and implementation of a computerized model designed to assist in planning the periodic rotation of personnel from sea to shore duty (referred to as SEAVEY). This model, the SEAVEY Planning Model, incorporates conceptual developments derived from the analysis of current planning procedures as well as new techniques and methods developed in this research. The model automates the computational procedures of rotation planning and summarizes the resultant data in a two part document which is designed to present to the SEAVEY planners all the mathematically based data necessary to make the decisions regarding rotation of personnel to shore. The model was successfully pre-tested and implemented in the Bureau of Naval Personnel in September 1967.

Navy Recruitment Survey. September 1967. H. J. Dupuy and R. W. Deimel. (W)

This study was conducted to determine the relative impact of personal contacts, personal reasons, and Navy publicity as motivating factors on the enlistment and reenlistment decisions of men entering the Navy through the recruiting stations. A questionnaire was administered at all U. S. Navy recruiting stations in July 1967 to 2,618 men enlisting or reenlisting in the Navy. The questionnaire contained 6 background questions and 24 questions covering the strength of influence of various reasons for entering the Navy. A space was also provided for a write-in response if the main reason(s) for one's enlisting were not mentioned in the survey.

Among the various influences on first enlistees' decision to join, "friends in service" and "parents" were the most important under Personal Contacts. The most important Navy publicity influences were:

Navy publicity in general
Navy booklets and pamphlets
Navy posters or signs
Recruiter visits to school

The four most important Personal Reasons for joining were:

Opportunity for technical training
Desire to travel
Serve country
Fulfill military obligation at own time of choice.

The four most important influences on the reenlistees were:

Desire for a Navy career
Navy career opportunities looked better than civilian life
Desire to serve country
Technical training opportunities

The major conclusion drawn from the findings of the study was that although personal reasons and personal contacts are important, Navy publicity in general, booklets and pamphlets, and recruiter visits to schools are also very effective current influences on decisions to enter the Navy.

A Study of Enlisted Personnel Retention in the Navy. SRR 68-6, September 1967. John S. Malone. DDC Accession Number AD 661 798. (With Technical Supplement SRR 68-6A)

This report presents the results of a research study designed to identify socio-economic, in-service, and personal variables related to the reenlistment rate of enlisted personnel in their first and second enlistments. The major source of data was a questionnaire administered on site to over 5,000 Navy men.

The major conclusion concerning first enlistment personnel is that this population is heterogenous and, therefore, general Navy policy and procedure changes would probably have negligible effects on reenlistments. The second enlistment population, however, was relatively homogeneous and could probably be affected more by general Navy policy and procedure changes relative to reenlistment.

Copies of the Correlation Matrices for the first and second enlistment populations are contained in Technical Supplement to this report (SRR 68-6A).

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Validation of Form 7 of the USN Basic Test Battery in 91 Class "A" Schools. STB 68-4, October 1967. Patricia J. Thomas and Edmund D. Thomas.

The Basic Test Battery (BTB) is administered to all Navy recruits. Scores earned on combinations of tests in the battery are used by classification personnel to assign men to a specific service school or to on-the-job training. Therefore, the validities of these selection instruments, singly and in combination, are of vital interest to the Navy.

In May 1964, Form 7 of the BTB superseded Form 6. However, the new test combinations used for school selection had yet to be cross validated on large samples of students. In addition, the inauguration of computer assisted classification procedures in late 1966 created a need for more exact prediction statistics. For these reasons, the current validation of the BTB was undertaken.

Final school grades for all Class "A" school graduates and for academic dis-enrollees are forwarded to this Activity on a routine basis. A sample extending from August 1964 through June 1966 was chosen for analysis and BTB scores for these men were obtained from the Enlisted Master Tape Record. Validity coefficients and regression equations were computed for each school reporting data for at least 100 students during this period. Comparisons were made between the old and new forms of the BTB and between the operational selection test combinations and alternative combinations.

Form 7 of the BTB was found to be an improvement over BTB-6 in most respects. However, one new test combination failed to meet expectations. Other tests were recommended for some of the schools using this combination for selection purposes. Regression weights obtained during the analyses are to be incorporated in recruit classification procedures.

An Evaluation of the Polaris Technician Pipeline. WRM 68-7, November 1967, Washington, D. C. W. B. Cooper. DDC Availability No. AD 823 293L.

This report contains information related to the required inventory for 100% manning of Polaris Technician billets; required replacement inputs to the Polaris Technician Pipeline; and the variables of non-reenlistment and rotation attrition.

Master and Chief Petty Officers' Perceptions of their Roles and Functions. November 1967. H. J. Dupuy. (W)

A survey questionnaire was mailed directly, by name, to all Navy E8/E9's in September, 1967, for the purpose of assessing their roles and functions, and the effects of rating compression on all compressed rates. Findings are based on 8,016 questionnaires returned as of 30 October 1967, which was 73.2% of the 30 September strength of 10,958.

Findings reveal that half of the E8/E9's expect to leave the Navy within three years. About seven in ten felt they could have profited from a formal training course designed for them; six in ten desired the opportunity to progress to WO and/or LDO. Half indicated that their present billets do not clearly require higher qualifications than for the next lower grade. Most felt that their billet assignments had contributed to their professional growth; however, over one-fourth felt that their general utilization was no higher than their utilization when at the E-7 level, and half indicated that their assignments or employment in the technical aspects of their rating was no higher than their E-7 level. Practically all desired clearer definitions of duties and responsibilities, and billet requirements. They also desired WO type signature authority and considered that their duties should be mostly supervisory, administrative, or as technical inspectors. Over sixty percent expressed satisfaction with current insignias; however, thirty percent of the E-9's desired a change in cap device similar to collar device.

SEQUIN II: A Computerized Item Selection and Regression Analysis Procedure. SRM 68-11, November 1967. William J. Moonan, John G. Balaban and M. Joyce Geyser. DDC Availability Number, AD-663 894.

This report generalizes a computerized test item selection procedure, called SEQUIN, previously reported (SRM 67-8). The generalization consists in extending the procedure to the items associated with several tests considered simultaneously. The program sequentially selects items from each test, combines these into total scores for each test and weights these total scores in a least squares regression equation which predicts a criterion variable. Items are selected that tend to maximize the multiple correlation coefficient between the total test scores and criterion score.

Career Motivation Incentive Study of Naval Reservists. December 1967. E. P. Somer. (W)

This report describes the results of a survey which was conducted to estimate the number of volunteers that might be obtained under the Reserve Active Duty Variable Incentive Bonus (RADVIB) and what effect it might have on overall career plans of such personnel.

A 5% random sample (1,075) of eligible enlisted men was obtained by mailing a questionnaire to a total of 33 Reserve Training Commands.

The RADVIB proposal would seem to be an effective plan in obtaining men to return to active duty. A total of 37% of the men surveyed would consider returning to active duty.

The RADVIB proposal would also seem to create a pool of career motivated men, inasmuch as a total of 69% of those that would consider returning also would consider staying until retirement. Projecting these findings to the total eligible population (20,000), approximately 7,400 men indicated they would consider returning to active duty.

Estimates by pay grade, and the number of years men would return by rating group are presented in this report.

The response to another question about the possible effects of other incentive plans seems to indicate as many as two-thirds of the men might be induced to return to active duty if an attractive enough incentive plan were created.

Comparisons of Retainees and Separatees among OCS Graduates on Background Prior to OCS Enrollment. WTB 68-1, December 1967, Washington, D. C. L. H. Sharp and A. Katz.

The objective was to determine which if any variables available at time of Officer Candidate School (OCS) selection differentiate between OCS graduates who extend their initial obligated service (3 years) as Naval officers (Retainees) and those who decide to be released from active duty (Separatees).

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Random samples of Retainees and Separatees (100 each) were compared on 55 background variables, using appropriate statistical significance tests of obtained differences. The variables consisted of 8 Demographic, 3 Aptitude, 8 Military Related, 15 Collegiate, 12 Hobby and 9 Various Other background variables. A significantly smaller percentage of Retainees than Separatees were found to have one or more Competitive Hobbies (46 vs 60 percent) and one or more Group Hobbies (29 vs 46 percent). Retainees had a slightly but significantly larger number of Organizational Memberships (mean of 3.21 vs 2.63). No significant differences on the other 52 variables were found.

The three statistically significant differences are approximately the number (at the .05 level) expected by chance alone. Even if they were to hold up in further study, differences of this magnitude are too small to be of any practical usefulness. These results clearly document the apparent futility of attempting to improve the retention rate of Naval officers through use of the background variables employed here in future OCS selection.

Fleet Ballistic Missile Weapons System Statistics: Manning Status and Trainee Averages. WSS 68-18, December 1967, Washington, D. C. W. J. Pawlowski.

Summarized within this report are the following: Manning Status on board 41 SSB(N)'s and 5 Tenders (AS); Comparisons between allowances and personnel on board for instructors at Fleet Ballistic Missile Weapons System training activities; statistics for students entering into training at the FBM Department Guided Missile School, Dam Neck, Virginia, between 1 June and 1 December 1967; and overall Navy allowances, distribution and inventories of FBM Weapons System Personnel.

Motivational Effects of the Associate Degree Completion Program, Report I. December 1967. S. B. Ware. (W)

This report describes the results of the first of a series of studies which are being conducted to aid in evaluating the career motivation value of the Associate Degree Completion Program (ADCOP) for career enlisted personnel.

Survey questionnaires were mailed to the 142 men currently participating in the pilot program. Questions in this survey dealt with background information, career motivation, education, and expectations concerning ADCOP. Space for general comment was provided.

Findings show that the majority of the men presently enrolled in ADCOP are enlisted personnel in pay grades E-6 and E-7. They are educationally oriented as evidenced by both past performance and future educational aspirations. They are career motivated and have high rank aspirations, most of whom hope to attain commissioned or warrant officer status. The majority expect to do quite well academically and think that completion of ADCOP will have an advantageous effect on their promotions and their ability to perform in their ratings. Comments from participants highly praised the program.

Motivational Determinants of Off-Duty Employment. January 1968. E. H. Blakelock. (W)

This report describes the results of a survey that was conducted to obtain information on the extent, causes and characteristics of moonlighting among Naval Personnel. A 10% sample of enlisted men and a 20% sample of officers at major commands in Washington, D.C., Norfolk, Virginia, New York City, San Diego, and San Francisco, California, were obtained. Due to the low rate (5%) of moonlighting among officers, only the responses of enlisted men are considered in this report.

Moonlighting is quite extensive in the areas surveyed. Twenty-three percent of the men held an extra job at the time of the survey, and 37% worked at off-duty employment during the past 12 months. Forty-one percent said they would take an extra job if one were available.

In order to predict moonlighting as against non-moonlighting and heavy vs light moonlighting the following hypothesis was tested. Moonlighting is a function of the man's having the financial need, the opportunity, and the skill. This hypothesis received moderate support.

In general, the moonlighters are: married, have more dependents, are of middle grades, assigned to duty stations longer, and are typically between the ages of 25-29 years.

The heavy moonlighters (working 25 or more weeks a year) are married, have more dependents, are the recipients of higher pay, and have been assigned to the same duty area longer.

In general, while the moonlighters feel fatigued by their work, they do not feel that it has hurt the performance of their Navy jobs.

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Predicting Foreign Language Achievement of Officer and Enlisted Personnel.

STB 68-8, January 1968. Idell Newmann, Norman M. Abrahams and William H. Githens.

The purpose of this study was to evaluate several experimental motivational and biographical measures, with the intention of improving the prediction of foreign language achievemet afforded by the Foreign Language Aptitude Test (FLAT) alone.

An extensive test battery was administered to language students at the Defense Language Institute, West Coast Branch (DLIWC). Predictors evaluated were: Tests given prior to language training, instructor ratings based on the first week of class, and information available from DLI records.

The 20 languages were categorized into three groups: (1) Indo-European (Western), (2) Indo-European (Eastern), and (3) Indo-Chinese. Empirical keys were constructed within and across language groups for three tests: (1) Personal Data Questionnaire (PDQ), (2) Navy Adjective List (NAL), and (3) Strong Vocational Interest Blank (SVIB). Other measures such as age, educational level, instructor's ratings, and scores on the Insolence Scale and Vocabulary Learning Test were also evaluated for predictive validity. Finally, multiple-regression analyses were performed to assess any improvement in prediction.

For the two Indo-European language groups the FLAT score combined with the instructor's first week rating resulted in improved prediction. However, if it is not economical to obtain and use such ratings for selection after the first week, feasible alternative equations are presented. Under these circumstances, for the Western languages, a weighted combination of Educational Level, the PDQ, and the NAL, along with the current cutting score on the FLAT, is recommended. For the Eastern group, FLAT and the Vocabulary Learning Test are the recommended variables. The equation presented for the Indo-Chinese group weights Pay Grade and the FLAT.

The Strong Vocational Interest Blank in Predicting NROTC Officer Retention: Part I. Validity and Reliability. STB 68-7, January 1968. Norman M. Abrahams, Idell Neumann and William H. Githens.

The majority of NROTC commissioned officers leave active duty soon after completing their obligated duty. The purpose of this research is to evaluate an interest scale, based on the Strong Vocational Interest Blank (SVIB), for use in selecting those NROTC (Regular) applicants most likely to remain on active duty beyond the minimum obligated period.

Considerable evidence has been accumulated indicating interest measures to have value in predicting persistence in an occupation. This general evidence, as well as preliminary data specific to naval officers, suggests that intensive research on the SVIB as a predictor of naval career choice would provide a promising approach to the problem of officer retention.

Since 1964, the SVIB has been administered experimentally to various naval officer groups. Item analysis of high and low tenure officer yielded an empirical retention scale that was evaluated for validity, fakability, and reliability in the present study.

When applied to cross-validation samples, the new scale was found to have relatively high validity. Reliability data indicated an acceptable level of score stability over eight and ten year intervals. Fakability was assessed and a scale for detecting dissimulation was constructed. It was concluded that while some examinees can increase their scores on the retention scale if under special instructions to do so, applicants, in fact, show little or no tendency to distort their scores. The continued use of the SVIB in officer selection is strongly indicated.

Attitudes and Experiences of Naval Personnel Relating to Career Motivation, Enlisted Performance Evaluation System, and Uniform Preferences. WRR 68-14, February 1968, Washington, D. C. DDC Availability No. AD 833 682.

In accordance with SECNAV Instruction 1000.8A, the semi-annual Navy Personnel Survey 67-1 was conducted to collect attitudes and opinions regarding various aspects of naval service directly from naval personnel. The survey was conducted during August, September and October 1967.

Information included here is timely and useful, not only as a reference tool for management, but as supporting information for proposed legislation or in answer to inquiries. Topic areas included in this report are: service experiences and background, career motivation; the enlisted performance evaluation system; voluntary education programs and reenlistment incentives; uniform preference; and a special study of unrestricted line officers.

Basic statistical information by pay grade and designator or rating groups derived from the responses of the world-wide sample of 5.7% of male officers and 2.5% of male enlisted personnel, is furnished. Since the sample pay grade distribution agrees closely with the population distribution with regard to pay grade, the responses can be utilized with reasonable assurance to reflect the actual population.

The Strong Vocational Interest Blank in Predicting NROTC Officer Retention: Part II. Fakability. STB 68-9, February 1968. Norman M. Abrahams, Idell Neumann and William H. Githens.

Since 1964, the Strong Vocational Interest Blank (SVIB) has been administered to NROTC (Regular) applicants. Inasmuch as retention scale scores from the SVIB are used in selection, it was essential to assess this scale's fakability.

A great deal of civilian research has indicated the SVIB to be of value in predicting occupational tenure. In addition, recent research at this Activity on this instrument has indicated its value in predicting naval officer tenure.

The responses of several groups of subjects administered the SVIB under a variety of conditions were contrasted. A scale reflecting differences between standard and faked responses was constructed and applied to a variety of NROTC samples for comparison.

It was recommended that since faking does not appear to be a serious problem, the use of the SVIB career retention scale be continued in officer selection.

An Analysis of the Applicability of the Personnel Qualification Standards Concept in the Evaluation of Personnel Readiness. WSS 68-22, June 1968, Washington, D. C. N. E. Dozier.

Contains the results of an analysis which assessed the implications and applicability of the Personnel Qualification Standards (PQS) Concept in the evaluation of shipboard personnel readiness. The conclusion is reached that the current state of the concept does not contribute to the PRL efforts.

Civil Engineer Corps Career Motivation Study. WRR 68-18, June 1968, Washington, D. C. E. P. Somer and S. B. Ware.

Reported are the findings of a survey which was to conduct research of an exploratory nature on the attitudes, opinions, and experiences of CEC officers. The following areas and their relationship with career motivation were studied: Duty Assignments, Education and Training, Utilization of Professional Training, Reasons for Initial Entry, Career Plans and Related Experiences, Civilian Experiences. Generally, the attitudes of CEC officers on active duty are similar to those who left active duty.

Some of the major findings were: During the next three years, ending 30 June 1971, approximately 52% of the Corps will leave active duty for retirement or other reasons. The present draft situation seems to be a factor in attracting men to join the Corps. Occupational/educational considerations was the most frequently selected statement as best describing the reason for Corps member's career decision.

It was suggested that better procedures should be used to select potential CEC officers. Because of the unique duties and responsibilities and the types of duty performed in the Corps, it would seem desirable that CEC candidates should be selected whose interests, attitudes, and goals are more in keeping with the objectives of the Corps.

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Comparison of Classification Strategies by Computer Simulation Methods.
STB 68-11, June 1968. Edward F. Alf and John Wolfe.

The effectiveness of several methods of classifying enlisted men for A-school training were compared using computer simulation methods. Using actual school quotas, nine different assignment methods were compared on seven assignment criteria using computer simulation methods with a sample of 587 enlisted men from NTC, San Diego. Of these men, 251 were assigned to A-school, and the remainder were assigned to the fleet. The seven criteria were: (1) aptitude test selector sums, (2) predicted final school grade, (3) probability of graduation, (4) training cost (without pay and allowances), (5) training cost with pay and allowances, (6) manning level ratio, and (7) criticality. Seven assignment strategies were used to maximize each of the above criteria. Two additional strategies were: (1) actual NTC assignment, and (2) random assignment. Random assignment was included as a base against which to evaluate improvement over chance.

The average payoff on any classification criterion is best for the strategy directed toward that criterion. The present operational classification strategy is far superior to random assignment. The best overall strategy, under the conditions of the present study, is assignment to maximize the probability of graduation from A-school. This strategy comes close to maximizing the other strategies investigated, and also results in relatively homogeneous talent groupings in the various schools. Classification to maximize probability of graduation is a strategy worth further investigation. Replication with larger representative samples is recommended.

Motivational Effects of the Associate Degree Completion Program, Report 2.
WRR 68-19, June 1968. Washington, D. C. S. B. Ware.

This report describes the results of the second of a series of studies which are being conducted to aid in evaluating the career motivation value of the Associate Degree Completion Program (ADCOP) for career enlisted personnel.

Survey questionnaires were mailed to the 42 men who were the *first graduating participants of ADCOP. Questions* on this survey dealt with background information, career motivation, education, and expectations concerning ADCOP. Space for general comment was provided.

Findings show that the majority of the men are educationally oriented as evidenced by both past performance and future educational aspirations. They are career-motivated and have high rank aspirations with most of them hoping to attain an advantageous effect on their ability to do a better job in their rating and on their promotions. Most of the graduates were very well satisfied with their schools and the quality of instruction they received. Comments from the men generally praised the program highly.

PARFORM: A Computer Program for Developing Statistically Parallel Tests of High Validity. SRM 68-22, June 1968. William J. Moonan and Charles R. Beauregard, DP2, USN.

This report is concerned with the development of a computer program that assembles two parallel tests of high validity from an available item set and criterion information. The heuristic program sequentially selects pairs of items such that the two forms to which these items are assigned remain as statistically parallel as possible. The criteria of parallelism made available by the program are variants of statistics devised by S. S. Wilks and D. F. Votaw, Jr. A printout of the program provides extensive psychometric information about the two forms as they are assembled.

Source, Warfare Specialty, and Tenure of High Quality General Line Officers. SRR 68-22, June 1968. William H. Githens, Norman M. Abrahams, and Idell Neumann.

Very little information is available on the relative quality of general line officers categorized by warfare specialty, procurement source, or retention status. Such information is needed in establishing desirable retention rates for officers from different procurement sources and warfare specialties.

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Information on (a) class standing in commissioning class, (b) aptitude test scores, and (c) performance ratings, available in various official records, was used for indices of officer quality in this study. These measures have not previously been assembled and analyzed for the present purpose.

The three indexes of officer quality described above were gathered for general line officers commissioned from seven procurement sources in 1958-1961. These data were analyzed for the 4,621 officers in the 1959 year group so that comparisons could be made among procurement sources, warfare specialties, and retention status.

When officer quality is judged in terms of aptitude test scores, class standings and performance ratings: (1) The Academy and NROTC Regular programs produce proportionately the most High Quality officers, although the OCS program produces the highest absolute number of High Quality officers, (2) the Sub-surface warfare specialty contains proportionally more High Quality officers than other warfare specialties, (3) High Quality officers are retained by the Navy in the same or a slightly greater proportion than officers in general, (4) Among the various sources, High Quality officers from the Academy, Naval Aviation Cadets, and Air Officer Candidates are retained in greater proportion than other officers from these sources, (5) analysis of differences between High Quality and overall retention rate within each specialty shows little difference between warfare specialties.

<ins>The Measurement of Navy Career Motivation in NROTC Applicants</ins>. SRR 69-2, July 1968. William H. Githens, Norman M. Abrahams, and Idell Neumann. DDC Availability Number, AD-674 851.

NROTC State Selection Committees are convened annually to select from applicants to the NROTC program those who are deemed most likely to become effective and career motivated naval officers. Statistical analyses of the selections made indicated the weight given to the variables in the applicants' records is not proportional to the actual validity of these variables, as revealed by follow-up research. The purpose of this report is to provide selection committees of the available research evidence concerning the validity of various predictors in identifying applicants disposed toward a naval career.

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During the past decade a number of research studies on the predictive validity of career motivation interviews, the Strong Vocational Interest Blank, background and sports information, as well as an analysis of earlier Selection Board actions, have been completed. Graphs and charts illustrating the relevant conclusions of previous studies are herein presented in conjunction with information on the selection decisions of the 1967 NROTC State Selection Committees.

(1) NROTC selection interview ratings do not predict officer tenure nor officer performance, within the range of acceptable NROTC applicants (pg 1); (2) State Selection Committees (including the 1967 Committees) permit the interviews to exert a considerable influence on the foregoing evidence relating to the value of the several indicators be presented to the State Selection Committees. It is believed that NROTC selection would be significantly improved if appropriate weight were given indicators of demonstrated validity.

A Comparative Evaluation of the Group IV Personnel Assigned to the USS CATSKILL. SRR 69-7, August 1968. N. H. Van Matre, Robert J. Harrigan and A. G. Archibald.

An evaluation was made of the capabilities and utilization of Group IV personnel aboard an operational Navy vessel (USS CATSKILL MCS-1). Assessments were made of a Group IV sample (N=116) and a comparison non-Group IV sample (N=82) in terms of aptitudes and experiential factors, training achievement, and preliminary shipboard performance.

The results indicate that the Group IV sample had significantly less formal education, lower chronological age, and a shorter length of enlisted service, than the non-Group IV personnel. The Group IV sample averaged significantly lower aptitude test scores and lower professional performance scores than the non-Group IV sample. In addition, more discipline problems and lower supervisory ratings were recorded for the Group IV sample than the non-Group IV personnel.

A pre- and post-cruise evaluation will be conducted to determine the extent to which the sample of Group IV personnel are successfully integrated into the crew of the CATSKILL.

Motivational Effects of the Associate Degree Completion Program, Report 3. WSR 69-1, September 1968. T. W. Muldrow. DDC Availability No. AD 840 757.

This report describes the results of the third in a series of studies which are being conducted to aid in evaluating the career motivation value of the Associate Degree Completion Program (ADCOP) for career enlisted personnel.

Survey questionnaires were mailed to the 36 men and one WAVE who comprised the second ADCOP graduating class. Questions on this survey dealt with service and personal background, career motivation, and opinions of ADCOP.

Findings show that the majority of the graduates are in paygrades E-6 and E-7. They have at least 10 years, AFMS, plan to remain on active duty until eligible for retirement, and hope to attain at least a bachelor's degree. Most of the graduates were satisfied with the quality of instruction they received and felt prepared to handle the course work. The students generally praised the program highly.

A Note on the Quadrant Analysis Technique for Identifying Moderator Variables. SRM 69-2, September 1968. Norman M. Abrahams.

This discussion points out a serious methodological problem of "quadrant analysis" (QA), a method for identifying correlates of individual differences in predictability. QA involves division of the predictor-criterion scatter-plot into four cells by cutting at the predictor and criterion medians. For cases below the predictor median, and separately, for cases above the predictor median, a comparison is made between the test responses and scores of those above the criterion median with those below. The distinguishing responses and scores are combined into moderator variables, one for each predictor group. To the extent of the relationship between the predictor and criterion, cases above and below the criterion median within each predictor category are not equivalent on predictor scores. Because of these differences, items or scores found to differentiate between comparison groups may reflect merely the predictor composite differences. Moderators developed through QA may therefore be predictive only of the composite predictor itself.

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An Analysis of the Navy Enlisted Performance Evaluation System. STB 69-2, October 1968. Patricia J. Thomas. DDC Availability No. AD-683 320.

The Report of Enlisted Performance Evaluation (NAVPERS 792) provides for the evaluation of enlisted men on five traits. Minimum marks on specific traits and on the overall average of all marks have been established for certain administrative actions. The most recent studies of the effectiveness of this rating form were conducted almost a decade ago and there is reason to believe that, due to restriction in marks assigned, the NAVPERS 792 is no longer an adequate instrument for evaluating enlisted performance.

Three areas of performance evaluation were investigated: first, the administrative uses and needs for performance information were determined; second, the method of teaching evaluation techniques was investigated; and third, a Navy-wide sample of NAVPERS 792s was collected and the marks and comments thereon were statistically analyzed.

The following conclusions and recommendations resulted from this research: (1) Acceptable distributions of NAVPERS 792 marks should be established and enforced. (2) A separate rating form should be developed for senior petty officers. (3) More adequate indoctrination of petty and commissioned officers concering the NAVPERS 792 and its use is needed. (4) The NAVPERS 792 should be used as a counseling instrument. (5) Certain changes in content and format should be made on the NAVPERS 792. (6) The NAVPERS 792 should be redesigned for use with automated data processing equipment.

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An Analysis of the Navy Vocational Interest Inventory as a Predictor of School Performance and Rating Assignment. SRR 69-11, October 1968. Norman M. Abrahams, Alan W. Lau and Idell Neumann.

In order that maximum utilization be made of the Navy's input of enlisted men, it is necessary that tests be developed for recruit classification which tend to place each man in training for the rating in which his likelihood of successful performance and career motivation is greatest.

As part of a program to evaluate non-cognitive tests for use in recruit classification, the Navy Vocational Interest Inventory (NVII) was validated against "A" school achievement and analyzed for its ability to differentiate men in different ratings.

The NVII was administered experimentally to incoming students at seven "A" schools varying widely in curriculum. The number of men in each school ranged from 77 to 240. In addition to the NVII, scores on Basic Test Battery (BTB) subtests were available for men in each school. Multiple correlations were computed, thus allowing validity comparisons of the BTB in predicting "A" school achievement to be made with and without the addition of the NVII scales. Average NVII scale profiles of the different occupational groups were compared. Analysis of the data indicated the NVII scales to be quite effective in differentiating men in various schools, thus indicating the potential usefulness of the NVII as a classification instrument.

The NVII scales were also found to contribute significantly to the prediction of "A" school achievement. Since the criteria employed were of an interim nature, the promising results reported here are being followed by an analysis against fleet performance and career motivation.

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Selection of Military Personnel for Foreign Language Training. SRR 69-6, September 1968. Idell Neumann, Norman M. Abrahams and William H. Githens.

A program of research has been initiated for the Defense Language Institute (DLI) to develop tests and other procedures for improving selection of language trainees.

Currently selection of students is primarily based on the Foreign Language Aptitude Test (FLAT). Since present DLI selection procedures do not include systematic measurement of trainee motivation, noncognitive measures were considered for selecting foreign language students.

In addition to FLAT scores, several measures such as the Personal Data Questionnaire, the Navy Adjective List, and Instructor Ratings were gathered experimentally at the Defense Language Institute West Coast. Using final class standing as a criterion, the predictors were validated alone and in combination.

Prediction of language achievement can be markedly improved by an instructor's rating obtained at the end of only one week of instruction--or even one day if need be. If "trial training" were implemented for the purpose of obtaining Instructor's Ratings prior to the inception of formal training, considerable expense may be avoided by eliminating those students considered substandard by the instructors.

If brief trial training proves to be infeasible and an ample number of potential trainees are available, some improvement may also be achieved if selection were based on paper and pencil tests, i.e. a combination of the Personal Data Questionnaire and Foreign Language Aptitude Test scores.

If either or both of the two procedures (i.e., paper and pencil tests and Instructor's Rating) are adopted for operational use, follow-up research is recommended on a larger sample of Navy personnel to improve the accuracy of the weights and cutting scores used, since the DLI included members of all the military forces.

Veteran Naval Aviator Survey. WSR 69-2, September 1968. R. W. Deimel and S. S. Stumpf. DDC Availability No. AD 840 761.

A survey questionnaire was administered in March 1968 to veteran naval aviators in an effort to: (1) determine how many veteran Navy pilots who left active duty since 1963 with the rank of LCDR and below are now employed as commercial airline pilots: (2) determine if and how much of a monetary inducement would be sufficient to attract veteran pilots to return to active duty for periods ranging from one to five years; and (3) compare these findings with those of a similar study conducted two years ago.

Sixty-eight percent of the respondents were presently employed as commercial airline pilots. Eight in ten of those employed as airline pilots obtained their employment immediately upon separation from active duty. The median salary for commercial airline pilots was $15,120 compared with $11,110 for those never employed by the airlines.

The longer the proposed period of return to active duty (from 1-5 years), the more respondents would not return for any amount of money. The percentage of those who were presently airline pilots who said they would not return ranges from 67% for one year to 81% for five years, compared with 59% and 67% respectively for the non-pilots. It would require about 1-1/2 to 2 times the amount of bonus money to induce airline pilots to return to active duty than to induce the non-pilots.

Attitudes and Experiences of Naval Personnel Relating to Morale Services, NPS 66-1. WSR 69-3, October 1968. DDC Availability No. AD 845 188.

This periodic Naval Personnel Survey was conducted in August/September 1966, to ascertain the attitudes and experiences of a worldwide, all-Navy sample of approximately 8% of the officers (N=5,392) and 6% of enlisted personnel (N=20,943).

Topic areas of the study include a wide range of subjects such as service experiences and background, career plans, All Hands magazine, library services, and incentive pay. Attitudes and expressions of male officers and enlisted men are presented, giving a clear picture of the feelings of the fleet. Responses to all questions are displayed by paygrade. Because the sample agrees adequately with the population in regard to paygrade, the responses can be utilized with assurance that they accurately reflect the feelings of the population.

NORMIX Program Documentation. SRM 69-11, December 1968. John H. Wolfe. DDC Availability Number, AD-682 213.

This report describes the operation and use of program NORMIX - a method of cluster analysis and unsupervised pattern recognition. The program takes the scores or measurements of as many as 1000 individuals or objects and groups them into different types under the assumption that each type has a multivariate normal distribution of the scores. Complete program listings and illustrative printouts for the Fisher Iris data are included.

NORMAP Program Documentation. SRM 69-12, December 1968. John H. Wolfe. DDC Availability Number, AD-682 200.

This report describes the operation and use of Program NORMAP - a method of cluster analysis and unsupervised pattern recognition. The program takes the scores or measurements of as many as 1000 individuals or objects and groups them into different types under the assumption that each type has a multivariate normal distribution of the scores and that all the distributions have the same covariance matrix. Complete program listings and illustrative printouts for the Fisher Iris data are included.

Fleet Performance of Project 100,000 Personnel in the Aviation Structural Mechanic S (Structures) Rating. SRR 69-17, February 1969. G. Douglas Mayo. DDC Availability Number AD-685 601.

The fleet performance of a small group of Project 100,000 (low aptitude) personnel was assessed by means of an evaluation form completed by their supervisors after the man had been on board for approximately seven months. The men previously had been trained for the Navy rating, Aviation Structural Mechanic S (Structures), AMS. The performance of non-Project 100,000 personnel working in the AMS rating, who had been attached to the same squadrons for a comparable

A Microfilm System for Improving the Dissemination of Navy Occupational Information to Recruits: A Feasibility Study. SRR 69-18, March 1969. LT K. A. St. Michel, USN and L. C. Swanson. DDC Availability Number, AD-687 430.

This research evaluated the feasibility of a microfilm system for providing information about Navy ratings to recruits and evaluated the adequacy of Navy job information presently being given to recruits. Additionally it provided information about (a) what job information is considered most important, (b) the effectiveness of different ways of learning about Navy occupations, and (c) the recruits' expressed satisfaction regarding job assignments. The microfilm system investigated was considered too costly for implementation in recruit training at present. A recommendation for tryout and evaluation of a simplified microfilm method was made.

Pattern Clustering by Multivariate Mixture Analysis. SRM 69-17, March 1969. John H. Wolfe. DDC Availability Number, AD-684 087.

Cluster analysis is reformulated as a problem of estimating the parameters of a mixture of multivariate distributions. The maximum-likelihood theory and numerical solution techniques are developed for a fairly general class of distributions. The theory is applied to mixtures of multivariate normals ("NORMIX") and mixtures of multivariate Bernoulli distributions ("Latent Classes"). The feasibility of the procedures is demonstrated by two examples of computer solutions for normal mixtures models of the Fisher Iris data and of artificially generated clusters with unequal covariance matrices.

An Attitudinal Study of Resigned/Retired Nuclear Trained Submarine Officers. WSR 69-4, April 1969. T. W. Muldrow. DDC Availability No. AD 851 868.

This report reveals the results of an exploratory study on the attitudes, opinions and experiences of former Nuclear Power Trained Submarine Officers regarding various aspects of the nuclear submarine service.

Survey questionnaires were mailed to all resigned/retired Nuclear Power Trained Submarine Officers for whom a mailing address was available (N=127). Questions dealt with service experience, incentives and post-Navy experiences. Two write-in questions were included which requested the respondent to recommend changes which he felt would increase the career attractiveness of the submarine service.

Findings show that the majority of the respondents were lieutenants when they left active duty and were graduates of the Naval Academy. The majority of the respondents would not be willing to return to active duty for any amount of money. Many indicated a willingness to return if certain changes were made in the submarine service. Forty-nine percent of the respondents are presently in positions which are related to their nuclear power training and experience. Presently, 10% of these ex-submarine officers are enrolled in graduate schools. There were two basic dissatisfactions with the submarine service--lack of personal and professional development, and lack of stability of family life.

Prediction of OCS Grades and Fitness Report Marks. SRR 69-15, April 1969.

Alan W. Lau, William H. Githens and Norman M. Abrahams.

This report describes research designed to improve two personnel decisions which the Navy must make relative to the input and output of Officer Candidate School (OCS). The first decision is made by the Administrative Board of Applications Review (ABAR), which considers all relevant applications data in deciding which men to accept and which to reject for entry into OCS. The second decision is made by the Officer Distribution Division of the Bureau of Naval Personnel, which must determine the best assignment for each man OCS graduates.

Previously gathered research data were reanalyzed to permit evaluation of the validity of various combinations of OCS selection information. The purpose of the analysis was to improve prediction of future performance both at the time of selection to OCS and at the time of graduation. Multiple regression statistical procedures were used for the analyses.

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A combination of scores available at the time of selection resulted in usefully valid correlations with both OCS grades and officer performance. A combination of final grades and selection scores available at the time of graduation from OCS resulted in quite encouraging correlations with officer performance. Tables are provided to demonstrate a method of using selection information in screening OCS applicants. At the time of selection, these tables enable prediction of OCS grades, fitness report marks at shore billets, and overall fitness report marks. At the time of graduation, when OCS grades are available, another set of tables provides even better prediction of fitness report marks at shore and fitness report marks at sea. The problem of determining the importance of various criteria such as OCS performance, on-job performance, and career retention is discussed.

Submarine Sonar Technician Personnel Characteristics and Training Paths. WRM 69-15, April 1969. G. R. Bunde and R. L. Grillo. DDC Availability No. AD 852 092L.

Selected Personnel and training data concerning the Submarine Sonar Technician are presented which relate to the Submarine Sonar Programs. This report contains information on: selection criteria, educational background, aptitude requirements, training content, training paths, and Navy Enlisted Classifications (NEC) inventory.

Design and Fleet Trial of an Automated Performance Evaluation Form for Chief Petty Officers. SRR 69-25, May 1969. D. W. Robertson.

Analysis of the distribution of marks on the operational Enlisted Performance Evaluation Form (NAVPERS 792) has indicated that Chief Petty Officers (CPO's--the top three enlisted Pay Grades, E-7/8/9) were uniformly graded so high that the usefulness of the marks to advancement or assignment boards was seriously impaired. Additionally, since the operational form was not amenable to machine processing, serious delays in monitoring evaluation marks have been experienced. The development of a new automated (optical Mark Reader type) evaluation report tailored to the CPO group was undertaken to correct these problems.

Five experimental versions of a newly designed CPO Evaluation Form, and a User (Evaluator's) Reaction Questionnaire, were administered in a field trial. The format most effective in discriminating various levels of performance, and the instructions and procedures necessary for smooth operational implementation of the new automated form were derived from the analysis of the field trial data.

All five experimental forms provided distributions substantially more discriminating than had been provided by the operational form. There were significant differences among the five forms themselves.

As a result of the analysis a number of recommended design and format features were incorporated in a new form which has been made operational.

In spite of some short-comings, comparative (peer group) evaluation scale terminology was found to be superior to absolute evaluation scale terminology when evaluating individuals of the high quality, leader-type CPO group.

Navy Personnel Survey NPS 68-1 - Reactions and Experiences of Naval Personnel Relating to Career Incentives, Programs and Benefits. WSR 69-6, May 1969. R. W. Knitter, S. S. Stumpf and S. E. Dow. DDC Availability No. AD 854 088.

The Navy Personnel Survey is one of a series of semi-annual surveys conducted to collect attitudes and opinions about various aspects of naval service from a representative sample of Navy military personnel. This survey was administered during December 1968 and January 1969.

Topic areas in this report are: service experiences and background; career motivation; career incentives and education programs; morale and related services; and pay and retirement benefits. Information included here can be useful as a reference and also in answer to inquiries.

Basic statistical information is derived from responses to the world-wide sample of 5.5% of male officers and 2.6% of enlisted men. Officer data is presented by rank, designator, original obligation and marital status and enlisted data is presented by rate, enlistment, and marital status. With regard to rank, and rate distributions, the sample agrees adequately with the population; therefore, the responses can be utilized with reasonable assurance to reflect the actual population.

Recruitment Survey - Motivational Factors Influencing Enlistment Decision. WSR 69-5, May 1969. R. W. Deimel and E. H. Blakelock. DDC Availability No. AD 853 810.

This report contains the results of a survey conducted to determine the motivational factors affecting the enlistment decision in 1968. Where possible, the results of this survey were compared to those of a similar study conducted in 1967.

Questionnaires were sent to the Recruiter-in-Charge at all Navy Recruiting Stations, Branch Stations, and Sub-Stations, with instructions to survey every man who applied for enlistment during the week of 9-14 September 1968. Information was obtained on the respondents' backgrounds, their reasons for enlisting in the Navy and their career plans. Responses were received from 2,926 men.

Personal Reasons were the foremost influences in the 1968 Enlistment Decision.

The Navy Recruiter was the single most influential personal contact.

Publicity, both Navy and civilian in origin, exerted considerable positive influence upon the enlistment decision. The High School News Service Report, however, exerted only negligible influence.

The relative impact on the reenlistment decision of items within Personal Reasons and within Navy Recruiting Publicity did not change substantially from 1967 to 1968. However, the percentage of individuals who were favorably influenced by these items declined somewhat during this period.

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An Analysis of the Navy Vocational Interest Inventory as a Predictor of Career Motivation. SRR 69-27, June 1969. Alan W. Lau, Lynn A. Lacey, and Norman M. Abrahams.

The purpose of this research is to evaluate the effectiveness of a vocational interest test as a predictor of career motivation among enlisted men.

As part of a program to evaluate non-cognitive tests for use in identifying enlisted men most likely to remain in the Navy, the Navy Vocational Interest Inventory (NVII) was analyzed for its ability to predict career motivation.

The NVII was administered experimentally to incoming students at seven "A" schools varying widely in curriculum. Scores were obtained on two different types of scales, empirically derived occupational scales, and homogeneous (area) scales. A reenlistment criterion was later obtained for each man by searching enlisted Navy personnel records. Mean NVII occupational key and area scale scores were computed for reenlistees and non-reenlistees in each school. An intercorrelation matrix was computed for each school, and multiple-regression analyses were completed on occupational keys and area scales using retention as the criterion variable. The area scales were analyzed for their ability to differentiate men in different ratings.

Analysis of the data indicated that both the occupational keys and the area scales aided in identifying "A" school students most likely to remain in the Navy. Although the differences were not substantial, the occupational keys were somewhat more effective than the area scales in predicting reenlistment. Since sample sizes were not sufficient for cross-validation of the various combinations of predictive scales, the promising results reported here are being followed by a program of large-scale testing for cross-validation purposes and further development of the inventory.

Validation of a Biographical Information Blank as a Predictor of Retention Among Mechanical and Electrical-Electronics Enlisted Personnel. SRM 69-21, June 1969. J. E. Dann and N. M. Abrahams. DDC Availability No. AD-689 351.

The problem of optimal allocation of enlisted personnel into training programs is one of continuing concern to the Navy. In many cases, it would appear advantageous, both to the individual and to the Navy, to identify and give preference in this allocation to men likely to retain in the Navy. However, an effective means of predicting retention of enlisted men remains to be determined.

In this research, a Biographical Information Blank (BIB) developed to tap past experience in academic, sports, mechanical and clerical areas was investigated as a possible predictor of retention. The test has previously been validated against performance in electronics school and one of its items against reenlistment. However, the entire inventory has never been analyzed against a retention criterion.

Using samples of men in mechanical and electrical-electronics ratings, the BIB was studied as a possible selection and classification instrument for increasing the retention rate of enlisted personnel. Responses of reenlistees and non-reenlistees in each group of ratings were contrasted, and scales were constructed from items differentiating most effectively between the groups. Validities and cross-validities of these scales and of the individual items constituting them were obtained.

Scales empirically constructed from the BIB items yielded low validity against a reenlistment criterion for men in both mechanical and electrical-electronics ratings. However, one item--a career intention question--did show substantial ability to discriminate reenlistees from non-reenlistees in both samples. Based on this result, it was recommended that stated career intention be considered in making school assignments, especially when a choice must be made among recruits who are otherwise equally qualified.

Analysis of Career Plans of Fire Control Technicians M (Surface Missile Fire Control) 6-Year Obligors. WRR 70-2, July 1969. L. H. Sharp and A. Katz. DDC Availability No. AD 855 740.

The objectives were to ascertain the naval career plans of six-year obligors in the Fire Control Technician M (Surface Missile Fire Control) rating, and to obtain a better understanding of the reasons for these plans.

Various analyses were made of the responses to a 48-item Survey Questionnaire by 1,364 eligible respondents (93 percent return) to whom the Questionnaire had been mailed directly.

Principal findings are: (1) Only 6% of the respondents reported planning to stay in the Navy beyond their present commitments, 16% were undecided and 78% reported planning to leave the Navy; (2) a sizeable percentage reported planning to leave the Navy primarily to attend school under provisions of the Cold War GI Bill; (3) only 7% of those who had previously reenlisted for the Selective Training and Retention (STAR) Program, as compared with 3% of the non-STAR group, reported planning to stay in the Navy beyond their present commitments; (4) receipt/non-receipt of promised Navy school training is not significantly related to career plans; (5) twelve Aspects of Navy Life--notably Pro Pay, variable reenlistment bonus, retirement and survivor's benefits, etc.--were rated as significantly more important in making a career decision by both the Stay and Undecided groups than by the Leave group; and (6) three Aspects of Navy life--namely, Navy military life in general, freedom of personal life, and amount of leisure time--were rated as significantly more important in making a career decision by the Leave group than by the Stay group. Implications of these findings are discussed.

Personnel Reactions to Incentives, Naval Conditions and Experiences (PRINCE). WSS 70-1, July 1969. L. E. Appelbaum and E. H. Blakelock. DDC Availability No. AD 691 408.

This report presents a detailed plan for studying naval incentives, conditions, experiences and other aspects of Navy life as they relate to the reenlistment intentions and decisions of first term Navy men. Background characteristics, expectations, family and friends influences, duty assignments and satisfaction will also be studied. Previous military retention studies indicated that factors such as these are directly related to reenlistment behavior. Unlike the earlier studies, the plan represents the first large scale in-depth longitudinal study of these factors on Navy men.

The longitudinal approach will make it possible to determine: (1) how and when attitudes toward the Navy change over time as a function of service experiences, (2) what the causal relationships are between conditions in the Navy environment and attitudes toward the Navy, (3) when the reenlistment decision crystallizes and which conditions exert the most influences on this decision.

Approximately 10,000 to 12,000 Navy recruits will comprise the study sample. They will be administered seven (7) questionnaires over a four and one-half year period. The first and last administration will occur when the men enter the recruit training center, and six months after completion of the first four year enlistment, respectively. The remaining questionnaires will be administered at yearly intervals during the first enlistment.

Use of the Strong Vocational Interest Blank in Identifying Naval Academy Early Motivational Disenrollees. SRR 70-4, July 1969. Norman M. Abrahams, Idell Neumann and Joyce E. Dann.

Prior to beginning the first year academic curriculum at the Naval Academy, incoming midshipmen are required to complete "plebe summer"--a non-academic military training program. Typically, some members of each incoming class fail to complete this summer training, with the great majority of disenrollments being for motivational reasons. During the summer of 1968 a dramatic increase over previous years occurred in the number of voluntary motivational drops from the class of 1972.

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To determine whether these "drops" differ from remaining midshipmen, comparisons were made on SVIB occupational scales, basic interest scales, and individual item responses. The comparisons made on scale scores revealed several large differences in the SVIB scales reflecting interest in military, cultural-aesthetic, and sports activities, among others. The comparison of item responses made by the disenrollees with those made by the remaining midshipmen revealed 75 differentiating items which were assigned weights for construction of a scale. In order to cross-validate this scale, the plebe summer "motivational drops" from the class of 1971 were scored and compared with the remaining class. The validity of the empirical scale held up well on the cross-validation sample (r=.36) and inspection of the item content revealed several clusters of items, including sports, autonomy, leadership, aesthetics, among others, that may be further explored and refined. The validity of the empirical scale, together wil the results on existing scales indicates that the SVIB can aid in identifying those midshipmen most likely to voluntarily disenroll during Naval Academy plebe summer.

The Development of a Computer-Assisted Distribution and Assignment (CADA) System for Navy Enlisted Personnel. SRM 70-1, August 1969. Randall F. Whitehead, Roy N. Suiter and Robert P. Thorpe. DDC Accession Number AD 697 933.

This report describes the development of a computerized system to assist Navy personnel managers in carrying out the functions associated with the distribution and assignment of enlisted personnel. This Computer Assisted Distribution and Assignment (CADA) System is aimed at the most efficient interaction between the computer and human manager to help maximize the effectiveness of the distribution and assignment decision making process. In general, the CADA System will broaden the range of assignment alternatives for each man and billet, expand the number of decision criteria considered, and be more responsive to changes in the personnel and operational situation. Although the CADA System design outlined in this report is, from an operational standpoint, oriented toward application in the Pacific Fleet Enlisted Personnel Distribution Office (EPDOPAC), the basic conceptual and functional framework of the design has general application throughout the distribution and assignment system and to the Atlantic Fleet (EPDOLANT) in particular.

First and Second Class Boilermen's Attitudes toward Conversion to the Boilermaker Rating. WSR 70-1, September 1969. T. J. McDonough. DDC Availability No. AD 860 896.

The purpose of this study was to determine the attitudes of First and Second Class Boilermen (BT1 and BT2) regarding conversion to the Boilermaker (BR) rating.

A majority of the respondents indicated that poor chance for promotion as a BR was the strongest influence against converting to the BR rating. Operations and repair of boilers were the aspects of BT duty which the men most preferred. Two-thirds of the BT's indicated having some knowledge of BR conversion procedures and first learned that conversion was possible from other enlisted men. Perception of differences between BT and BR duties was found to be inversely related to grade and those who perceived greater differences between the duties had higher proportions of men who plan to change ratings. The men felt that more schooling should be provided to BR's and that BT's requesting conversion should definitely be schooled to improve their repair skills. Sixty-six percent of the men who would like to attend Welding School would be influenced to convert by guaranteed attendance. If Pro Pay were awarded to BR's, 46% of the respondents indicated they would request conversion. A majority of BT's would favor a single rating with NEC identifiers for men with repair skills.

An Appraisal of the Associate Degree Completion Program by its Graduates. WSR 70-2, October 1969. T. W. Muldrow. DDC Availability No. AD 863 615.

This report reveals the results of a study on the attitudes, opinions and experiences of the first group of ADCOP graduates six months after their return to the fleet.

Survey questionnaires were mailed to the 41 men who comprised ADCOP's first graduating class. Questions dealt with background information, career motivation and opinions of the program.

Findings show that the majority of the graduates felt their ADCOP education was of benefit to them in areas related to the job, social and family life. They perceived the greatest benefit to be in the area of improved communication skills. The majority of the graduates indicated they plan to remain on active duty until eligible for retirement, would like to attain Warrant or Commissioned Officer Status, and hope to complete requirements for at least a bachelor's degree before leaving active duty. The students generally praised the program highly.

A Preliminary Evaluation of Brief Navy Enlisted Classification Tests. STB 70-3, October 1969. Leonard Swanson and Bernard Rimland. DDC Accession Number AD 703 611.

Improved differential assignment of Navy recruits to schools and jobs would be possible if a wider range of aptitudes and interests could be measured without unduly lengthening the time used in testing. The purpose of this study was to make a preliminary evaluation of the effectiveness of a computerized item selection program, Program SEQUIN, for developing short tests from the full length tests of the Basic Test Battery (BTB).

Item responses of several samples of recruits to ten subtests of the BTB and Electronic Technician Selection Test were analyzed with Program SEQUIN. The criteria used were scores on a mid-training recruit achievement test and the Recruit Final Achievement Test. A double cross-validation design was used in which the short keys developed on one sample were validated on the other sample and vice versa.

Results were encouraging. Short tests were nearly as reliable as full length tests. Intercorrelations among the short tests were slightly higher than those among full length tests. The short tests were at least as valid as full length tests in key development and cross-validation samples. Short tests developed from predicting the Recruit Final Achievement Test were also valid for predicting the mid-training test scores.

Follow up studies using on the job performance as a criterion will indicate if the Navy classification tests could be shortened substantially with negligible loss in reliability and no loss or even a slight gain in validity.

Supervisor's Assessments of the Graduates of the Associate Degree Completion Program. WSR 70-3, December 1969. T. W. Muldrow. DDC Availability No. AD 865 532.

The objective of this study was to determine how supervisors of ADCOP graduates felt participation in the program affected the graduate's on-the-job performance, and general attitude toward the Navy.

During the last week of July 1968, questionnaires were mailed to each of the supervisors (N=41) of ADCOP's first group of graduating participants. Responses were received from all supervisors.

Findings show that the majority of the supervisors felt the ADCOP graduate was a greater asset to the Navy because of his junior college schooling, and that ADCOP would prove beneficial to the Navy and to the men who participate in the program. Nine out of ten supervisors considered the ADCOP graduate better in communication skills and a better representative of the Navy than his non-ADCOP peers.

Supervisors rated at least 70% of the graduates as "highly satisfactory" or "outstanding" on each factor related to their work. The highest ratings were given for areas included under "Adaptability on the Job as a Whole." These included Cooperation with Supervisors; Attitudes, willingness to learn; Dependability and Relations with fellow workers.

A Comparison Between the Armed Services Vocational Aptitude Battery and the Navy Basic Test Battery in Predicting Navy School Performance. STB 70-4, January 1970. Patricia J. Thomas. DDC Accession Number 702 416.

The Armed Services Vocational Aptitude Battery (ASVAB) was developed by a joint-service technical group, using items from the services' previously used operational tests. The ASVAB was designed as a potential replacement for the Armed Forces Qualification Test and the separate classification batteries used by each of the services. Thus, the effectiveness of the ASVAB in Navy classification needed to be determined and compared with the Basic Test Battery (BTB).

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The ASVAB was administered to all recruits at two Naval Training Centers and the men who subsequently attended a Navy Class "A" school were identified and their BTB scores and school grades obtained. The validities of the ASVAB and BTB tests were investigated within each school and linear-sum correlations were also computed to determine the best combinations of ASVAB tests as possible school selectors. A computerized item selection technique was applied to the tests in each battery. Various item statistics and validities and reliabilities for the shortened tests were obtained for use in evaluating Form 1 of the ASVAB and in development of subsequent forms.

Form 1 of the ASVAB was found to be too easy for effective discrimination among Navy students. Comparisons of the BTB and ASVAB validities uniformly favored the BTB. The linear-sum analysis of possible ASVAB classification composites revealed excessive dependence on the ASVAB Arithmetic Reasoning Test, making selection within a limited talent pool very difficult. It was recommended that: (1) subsequent forms of the ASVAB be made more difficult; (2) ASVAB validities for predicting school performance in the other services be determined; and (3) the effectiveness of the ASVAB for differential classification be improved.

Evaluation of Standards for Reenlistment. WRR 70-5, January 1970. L. H. Sharp, P. P. Foley, A. Katz and W. A. Sands. DDC Availability No. AD 863 979.

The objective was to evaluate and, if possible, improve current standards for reenlistment in the Navy.

Comparisons were made between unsatisfactory and satisfactory reenlistees on 17 predictors to determine which ones differentiated significantly between the two groups. Using the 9 more promising predictors thus identified and the optimally-weighted composite of these for predicting unsatisfactory/satisfactory performance in the population of reenlistees, the effects of using progressively higher cutting scores on each of these 10 predictors were determined when applied back to the population.

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The two predictors which differentiated best between unsatisfactory and satisfactory reenlistees are the same two on which recommended cutting scores are specified in the current reenlistment standards. Other findings clearly show that, in order to have appreciably reduced the percentage of erroneous acceptances and associated dollar costs, a disproportionately larger percentage of erroneous rejections and a serious worsening of the retention rate would have resulted by use of more rigorous reenlistment standards, at least when the predictors and criterion of satisfactory performance employed in this study were used.

Since the base rate of satisfactory reenlistees was found to be very high (93 percent) under current reenlistment standards, and assuming that losses incurred by such a disproportionate increase in the percentage of erroneous rejections exceed the savings effected by the accompanying small reductions in the percentage of erroneous acceptances, it appears that the Navy can ill afford to make its reenlistment standards more rigorous at the present time.

Biographical Differences Between Navy Recruits Grouped by Mental Level, Racial Identification and Career Intention. STB 70-2, February 1970. Charles H. Cory. DDC Accession Number AD 701 697.

This study is part of a larger research effort designed to (a) provide instruments for identifying the aptitudes and abilities most useful to the Navy in Mental Level IV personnel and (b) identify the duties most likely to be successfully performed by such personnel.

The present report provides an interim analysis of one of the experimental instruments--a biographical information form--developed for predicting effectiveness of Mental Level IV men. It has been prepared to present the demographic-type findings of the study to those concerned with the utilization of Mental Level IV personnel.

Although correlations between the biographical question responses and mental level were significant at the .001 level for 163 questions, the correlations were, in general, quite low. Mental level was most highly associated with the content areas of academic experiences, attitudes, and aptitudes and had its lowest correlations with areas involving job tasks or social activities. Negro respondents and those respondents who desired to reenlist in the Navy were found to differ significantly from the total group in the characteristics covered in the questionnaire.

A Computerized Model of the Sea/Shore Rotation System for Navy Enlisted Personnel. SRR 70-20, February 1970. Norman I. Borgen and Robert P. Thorpe. DDC Accession Number AD 876 417L.

This report describes the second in a series of computerized models of the Navy's rotation system for enlisted personnel. These models are being developed to provide the Bureau of Naval Personnel with operational tools for more efficient and effective management and administration of the rotation system and for the simulation and testing of policy decisions to determine their possible effects on the rotation of personnel before the decisions are made. The Sea/Shore Rotation Model encompasses the movements of personnel between the broad categories of sea duty and shore duty. While the Model can be used for planning and monitoring the overall movement of personnel in the rotation system, its primary purpose is to serve as a prototype model for refining the underlying methodology and for determining the preciseness of the input data used in the models as the basis for various projections required in the management of the rotation system. If this prototype model successfully meets these two objectives, it will be further refined and adapted for application in managing the full rotation system which involves the movement of personnel among the two types of shore duty and four types of sea duty. Research efforts will then be directed toward other aspects of the enlisted rotation system.

An Assessment of Faking on the Strong Vocational Interest Blank under Actual Selection Conditions. STB 70-6, March 1970. Norman M. Abrahams, Idell Neumann and William H. Githens. DDC Accession Number AD 703 612.

Since 1964, the Strong Vocational Interest Blank (SVIB) has been administered to NROTC (Regular) scholarship applicants. Inasmuch as an SVIB scale is used in selection for identifying potential career effectiveness, it was essential to assess this scale's fakability.

The responses of several groups of subjects administered the SVIB under a variety of conditions were contrasted. Under instructions to do so, some individuals can increase their scores by faking. However, in an analysis of retention scale scores obtained by NROTC applicants retested as freshmen, no significant tendency to fake emerged. This finding indicated that either faking does not occur under selection conditions or that faking was present in both the selection and freshmen administrations. These alternatives required further evaluation.

Strong Vocational Interest blanks taken by NROTC applicants as part of a routine non-Navy testing program were obtained and compared with those taken under actual NROTC selection conditions. The results of this analysis were compared with those obtained from the previously conducted simulated faking study.

Previous data indicated that when instructed to fake, most individuals can increase their scores on the selection scale to some extent. However, comparison of applicant and routine administrations indicates that under actual selection conditions there is neither a significant nor consistent tendency for applicants to increase their selection scores. These results suggest: (1) that simulated faking designs do not parallel what occurs in selection; instead, they provide only an indication of how much a scale can be faked, and (2) faking is not a serious problem in the use of the SVIB in NROTC selection.

A Non-Cognitive Test Battery as a Predictor of Class "A" School Performance. STB 70-5, March 1970. Alan W. Lau, Lynn Lacey and Norman M. Abrahams. DDC Accession Number AD 704 491.

Since most tests used in Navy Selection and classification are aptitude measures, the addition to the test battery of measures of job preferences and motivation seemed advisable. The purpose of this research is to evaluate the effectiveness of several non-cognitive tests as predictors of enlisted school performance.

As part of a program of evaluating non-cognitive tests for use in predicting performance in a group of representative Class "A" schools, the Hand Skills Test (HST), Navy Activities Preference Blank (NAPB), and Navy Adjective List (NAL) were analyzed for their ability to augment the validity of Basic Test Battery (BTB) scores in predicting school performance.

The non-cognitive tests were administered experimentally to incoming students at seven Class "A" schools varying widely in curriculum and to a sample of students in the Submarine School. Scores were combined with BTB subtests to determine if non-cognitive test scores supplemented BTB measures in multiple-regression equations.

Analysis of the data indicated that neither the NAPB, NAL, nor the HST contributed significantly toward the prediction of school achievement beyond that currently attainable with the BTB.

Prediction of Success in the U. S. Naval Preparatory School. WRR 70-7, March 1970. W. A. Sands. DDC Availability No. AD 866 796.

This is the first in a series of studies to assess and improve current procedures for selecting U. S. Naval Preparatory School (NPS) applicants. The average 85% attrition rate between NPS matriculation and graduation from the U. S. Naval Academy (USNA) represents an estimated *annual* loss to the Navy of between one and three million dollars.

NPS Final Grade Average (FGA) and USNA Selection vs Rejection (S/R) were the two criteria employed. Operational predictors consisted of five measures of previous academic achievement and the SCAT tests. Experimental predictors consisted of the SAT and two CEEB achievement tests. Correlational and multiple regression analyses were performed in a sample of NPS applicants (N=246).

The Current NPS Selection Composite is fairly effective in predicting FGA ($r=.643$). Higher validity for predicting FGA was observed for two optimally-weighted composites: operational predictors ($_cR=.733$); and, operational *and* experimental predictors ($_cR=.871$). In predicting S/R, the Current NPS Selection Composite has moderate validity ($r_{pb}=.402$). Equal or higher validity for predicting S/R was found for two optimally-weighted composites: operational predictors ($_cR=.398$); and, operational *and* experimental predictors ($_cR=.655$).

Cross-validation of these promising results and validation against more ultimate criteria (e.g., success in USNA) are planned. Procedures for the implementation of regression composites are outlined.

The Stability of Scores on the Navy Vocational Interest Inventory. SRR 70-17, March 1970. Alan W. Lau and Norman M. Abrahams. DDC Accession Number AD 703 623.

The purpose of this research is to evaluate the long-term stability of occupational and area scores on the Navy Vocational Interest Inventory (NVII).

In earlier research, empircally derived NVII occupational keys and the more general area scales were found to differentiate effectively between men assigned to various Class "A" schools, and to contribute somewhat toward the prediction of external criteria such as reenlistment and school performance. Since use of interest scores requires test-retest reliabilities that are high enough to permit planning long-range career goals, and since little evidence exists regarding NVII scale reliability, the present research was conducted to measure the degree of stability exhibited by NVII scores.

By searching enlisted Navy personnel records in 1969, 255 men were located of a group of 1,009 men who had taken the NVII in 1964-65. These 255 men were followed-up by mail and completed inventories were received from 208 of them (82%). NVII scores achieved by these men were compared to scores obtained from up to five years earlier. In addition, the occupational scale scores of all men who took the NVII in 1964-65 were compared to those of samples of men in the same ratings who took the inventory in 1951.

NVII scores for men who returned the inventory were found to be quite stable over a period of from four to five years. In addition, stability of interests within various Navy occupational families was found to be quite high. When the scores of men tested in 1951 were compared to scores of men in the same ratings tested 14 years later, a high degree of similarity of interest patterns was noted. It seems probable that the NVII measures interest patterns that are stable enough to permit recruit classification and the planning of long-range career goals for Navy enlisted men.

Motivational Factors Influencing Enlistment Decision, U. S. Navy Recruitment Survey 1969. WSR 70-4, April 1970. T. W. Muldrow. DDC Availability No. AD 705 117.

This report reveals the results of a study conducted to determine the factors which effected the enlistment decision in 1969. Where applicable, the results of this survey were compared with those of the two previous Recruitment Surveys.

Questionnaires were sent to the Commanding Officer of each Navy Recruiting Main Station with instructions to have them administered by the Armed Forces Entrance and Examining Station (AFEES) Navy Liaison Petty Officer to every first term male enlistee and CACHE recruit who processed through AFEES between 3 and 21 November 1969. Responses were received from each of the 37 Navy Recruiting Main Stations (N-4,069).

The "opportunity to obtain technical training," and the "desire to travel" were the most important personal reasons influencing eight out of ten enlistees to join the Navy. For seven in ten of the respondents, the "desire to serve country" and "to become more mature and self-reliant" were influential personal reasons.

The Navy Recruiter was the one Personal Contact who offered the most "encouragement" in the enlistment decision. Friends with service experience and parents were also a source of "encouragement." Wives or girlfriends offered little "encouragement."

Navy Recruiting Aids, Events and Information associated with the Navy, as perceived by the respondents, did not play as important a role in the enlistment decision as did personal reasons and personal contacts. Though the majority of the enlistees did remember seeing or hearing about these aids, they did not believe this publicity was a major influence in their enlistment decision.

The Navy Vocational Interest Inventory as a Predictor of Job Performance. SRR 70-28, April 1970. Alan W. Lau and Norman M. Abrahams. DDC Accession Number AD 704 856.

Little success has resulted from earlier attempts to develop psychological instruments to predict the job performance of enlisted personnel. Given a valid instrument, men could be assigned to those jobs in which their performance will be at a maximum.

Earlier research has shown that occupational Navy Vocational Interest Inventory (NVII) scales contributed toward the prediction of Class "A" school performance, and could aid in the identification of career motivated enlistees.

The purpose of this research is to evaluate the validity of the NVII as a predictor of enlisted job performance.

The NVII was administered experimentally to incoming students at seven Class "A" schools varying widely in curriculum. Scores on Basic Test Battery (BTB) subtests and Final School Grades (FSG) were also available as predictors of enlisted performance. Performance measures consisted of scores earned on the Report of Enlisted Performance Evaluation. Multiple correlations were computed between various combinations of predictors, using performance scores as the criterion.

NVII scales were found to be moderately related to performance scores in three of the seven ratings. In general, little or no relationship was found between interest scores and performance, nor did the NVII scales supplement BTB scores when the two were combined. Final Class "A" school grades appeared to be more effective in predicting performance than either BTB or NVII scores. Possible reasons for the low NVII validities observed are: (a) job performance criteria not sufficiently differentiating and relevant, and (b) samples too small for development of empirical performance prediction keys.

Validation of Form 7 of the USN Basic Test Battery in 108 Class "A" Schools. STB 70-7, April 1970. Patricia J. Thomas. For Official Use Only. Not for Distribution.

Periodic assessments are made of the effectiveness of the BTB tests as used in making post-recruit training assignments.

Final school grades were collected from all Class "A" schools during the period of July 1966 through December 1968. These grades were used as the criterion to determine the validities of single BTB tests as well as of all combinations of tests. Comparisons were made with the results of a parallel 1967 study, to investigate possible changes over time in the validity of the battery.

The overall validity of the BTB, judged by comparing the corrected multiple correlations during the two periods of time, remains at an acceptably high level. The recent validities were, in fact, generally higher than those in the earlier study. However, the effectiveness of several of the operational combinations of BTB tests could readily be improved. In 50 of the 106 schools studied, the operational composites were surpassed in validity by other combinations of tests. The poorest composite used in recruit classification was GCT+MECH+SP, a finding also reported in the 1967 BTB validity analysis.

For each school a comparison was made between the maximum validity achieved by simply adding scores to form three-test composites and by computing a multiple correlation for the best weighted combination of six tests. The latter procedure showed an average gain of only .02 correlation points, despite the use of more tests in an optimally weighted equation.

Relationships Among Aptitude Test Scores and Experiential Variables with Success in the Class "C" Welding School: A Recommendation for Modification of Current Selection Criteria. SRR 70-31, May 1970. Robert G. Wells and Macy L. Abrams. DDC Accession Number AD 870 059L.

Significant technological advances have created a requirement upon the Class "C" Welding School to provide the fleet with welders that can weld increasingly more exotic metals to substantially higher, more rigid standards. At present there is a relatively high failure rate in school's courses. Many factors contribute to the high failure rate, including the lack of an adequate selection standard. Recognizing this problem, the Officer in Charge of the Class "C" Welding School, requested this Laboratory to assist the school in the improvement of selection devices. The study examined the relationship of

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Navy Basic Test Battery (BTB) scores and selected experience variables with success in the welding courses to determine if any significant relationships could be found which could be employed as the basis of a modification of the selection device. Based on the results of the study, it was recommended that trainees admitted to the initial courses of the school, Fuel Gas and Plate, should be either Shipfitter "A" School graduates of have minimum BTB scores for ARI, and MECH of 45 and 55, respectively. It was also found that trainees with the higher final scores in the Plate Welding Course had a greater likelihood of success in the later courses.

Relationships Among Aptitude Test Scores and Experiential Variables with Success in the Nondestructive Testing Course, Class "C" Welding School: A Recommendation for Modification of Current Selection Criteria. SRR 70-26, May 1970. Robert G. Wells, and Macy L. Abrams. DDC Accession Number AD 870 055L.

Significant technological advances have created a requirement upon the Nondestructive Testing (NDT) Course of the Class "C" Welding School to provide NDT personnel who can inspect metals to substantially higher, more rigid standards. At the present time there is a relatively high failure rate in the certification phase of this Course. Upon request from the Officer in Charge, Class "C" Welding School, a study was initiated to determine if the high failure rate could be reduced by improving the Course's selection methods. The study examined the relationship of the Navy Basic Test Battery (BTB) scores and selected experiential variables with various measures of Course success to determine if any significant relationships could be found which could be employed as the basis of a modification of the selection device. The only significant relation found was between the GCT, ARI, and MECH BTB scores and success in the radiographic testing (RT) phase of the Course. This finding led to the recommendation that a combined score of 160 or above on these tests be requisite for Course and/or RT phase admission. The lack of other significant findings led to a recommendation for a modification of training procedures through curriculum redesign.

DK's, HM's, PN's, and YN's Perceptions of Conditions of Service, Satisfaction with Rating, Duty Assignment and Training. WSR 71-2, July 1970. T. W. Muldrow. DDC Availability No. AD 710 735.

The results of a study conducted to assess the attitudes, opinions and experiences of men in the DK, HM, PN and YN ratings regarding their views and perceptions of the conditions of naval service, satisfaction with their rating, their assignments and training are reported.

Questionnaires were mailed directly to a random sample of DK's, HM's, PN's and YN's currently on active duty (N=6,844). Responses were received from 4,331 of those surveyed.

Fifty-four percent of the respondents are satisfied with Navy life in general; Yeomen are the most satisfied and Disbursing Clerks are the least satisfied. Approximately nine in ten are serving in the rating of their choice. Hospital Corpsmen are the most satisfied and represent the greatest proportion of respondents who have no desire to change their rating. DK's are the least satisfied with their rating and represent the greatest proportion of respondents who have a desire to change their rating.

Most of the respondents have an understanding of the personal attributes required of their jobs, e.g., "patience," "objectivity," "understanding," "getting along with people." However, objectivity is not deemed as being required as much as the other three attributes.

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The Opinions of Navy Personnel Regarding Shipboard Living Conditions. WSR 71-1. July 1970. 29 pp. DDC Availability No. AD 709 425. L. A. Broedling.

This report summarizes data regarding shipboard habitability obtained from the Naval Personnel Survey administered in 1965 and the Naval Personnel Survey administered in 1969. The Naval Personnel Survey is designed to obtain the opinions of a representative number of enlisted men and officers on a variety of subjects related to the Navy.

Report of Enlisted Findings, Navy Personnel Survey NPS 69-1: Attitudes and Experiences of Enlisted Naval Personnel Relating to Career Incentives, Retention, Education, Personnel Services and Duties and Conditions of Navy Life. WSR 71-3. August 1970. 23 pp. DDC Availability No. AD 874 584. C. Braunstein.

NPS 69-1 is the seventh survey in the Navy Personnel Survey series. The NPS surveys are conducted on an annual basis to obtain information concerning the attitudes and opinions of Navy military personnel. The data is representative of the Navy enlisted population except for certain personnel groups excluded from the survey.

Topic areas covered by this report include service experiences and background, career, motivation, career incentives, education and other Navy programs, personal services and the Navymen's perceptions of their wive's attitudes toward certain aspects of Navy life.

Validity, Predictive Efficiency, and Practical Significance of Selection Tests. STB 71-1. August 1970. DDC Accession Number AD 719 379. Ervin W. Curtis and Edward F. Alf.

This report is based on research performed under Independent Exploratory Research funding. It presents a rationale and associated tables for use by researchers and others concerned with evaluating the practical effectiveness of personnel tests.

The report is reproduced here as it appeared in the Journal of Applied Psychology, 1969, No. 4, vol. 53.

The Improvement of Selection to Personnelman "A" School. STB 71-3. October 1970. DDC Accession Number 713 481. Patricia J. Thomas.

The Personnelman (PN) represents a major point of contact between the Navy and its enlisted men. The attitude the PN projects while performing his duties is believed to have an effect upon his service man-client's satisfaction with the Navy and subsequent reenlistment decision. Since all rated Personnelmen must attend "A" school, upgrading the performance of PN's can begin at the school selection point.

Experimental administration of several tests of intermediate memory ability, the Navy Vocational Interest Inventory (NVII), a Peer Rating, and an Instructor's Rating, was carried out at three PN "A" schools. The Final School Grade (FSG) of each student was used as a criterion. In addition, the efficacy of the NVII for predicting the performance of rated PN's in the fleet was investigated.

Midway through the testing phase of this research, a major course revision was instituted at the PN schools. The validity coefficients prior to this change were markedly higher than after. A comparison of the test performance of recruit and fleet input to the schools showed that virtually all of the validities were higher for recruit input although the fleet men earned higher FSG's. The NVII key developed to predict the PN Supervisor's Rating achieved a cross-validated r of .23, as compared with the GCT validity of -.02 and the ARI validity of -.01.

It was recommended that: (1) GCT and ARI be retained for recruit classification; (2) ARI be the sole BTB selector for fleet input to the schools; (3) the students in this study be followed to determine what effect the curriculum change had upon their on-job performance; and (4) consideration be given to increasing the proportion of fleet men in PN "A" school.

Navymen's Opinions of the Services Rendered by Personnel Offices, Disbursing Offices and Dispensaries. WSR 71-4. October 1970. 21 pp. DDC Availability No. AD 712 497. C. Braunstein.

This study was concerned with Navymen's opinions of the services given them at Navy Personnel Offices, Disbursing Offices and Dispensaries. A sample survey research design was used to obtain approximately 5,000 responses from a two percent random sample of the Navy enlisted population.

Although the majority of men were found to be satisfied with the overall service provided by Personnel Offices, Disbursing Offices and Dispensaries, a sizeable minority expressed dissatisfaction with the service given them. The men were most satisfied with the Personnel Office, less satisfied with the Dispensary and least satisfied with the Disbursing Officer.

The aspects of service analyzed fall into three groups - Managerial, Competence and Interpersonal. The men expressed the most satisfaction with competence aspects, less satisfaction with managerial aspects and the least satisfaction with interpersonal aspects.

Differences in degrees of satisfaction were also found between the lower and higher rated men and between men having different duty assignments.

Use of Biographical and Interview Information in Predicting Naval Academy Disenrollment. SRR 71-7. September 1970. DDC Accession Number AD 712 064. Joyce E. Dann and Norman M. Abrahams.

Given the attrition rate of nearly 30 percent for each entering U. S. Naval Academy class, an attrition prediction instrument for use in selection could represent considerable monetary savings.

In previous research, the Naval Academy Personal History Booklet (PHB) has shown some validity as a predictor of Academy disenrollment.

The present research evaluated a new method of coding and scoring the PHB and compared its validity with that of the psychiatric screening interview and Strong Vocational Interest Blank (SVIB).

PHBs administered in 1961-1963 as part of Academy application were obtained for 256 men who later disenrolled from the Academy and for 245 men who graduated with their classes. Eight attrition prediction scales were constructed and employed in a double cross-validation design. Half of the scales used only items of the PHB, while half included items based on the screening interview. A single rating based on the interview was also evaluated.

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The eight experimental scales showed key-development validities of .59 to .61 and cross validities of .11 to .22. Screening interview items contributed only .01 to validity of the best scales, while the single interview rating showed validities of only .11 and .07. By contrast, cross validities of SVIB disenrollment keys have ranged from .34 to .43.

The PHB scales are not recommended for operational use in predicting Academy disenrollment, as they have already been surpassed in predictive efficiency by the SVIB. However, some substantial validities for some PHB items suggest that further research be done on a multiple choice biographical inventory to supplement the SVIB.

Validity of the Officer Qualification Test for Minority Group Applicants to Officer Candidate School. WRR 71-1 (Revised). September 1970. 44 pp. DDC Availability No. AD 721 116. P. P. Foley.

The objective of this study was to investigate the possible bias of the Officer Qualification Test (OQT) against minority applicants to Officer Candidate School.

Comparisons made between the average criterion score (OCS Final Grade) of Negroes and Caucasians which were matched on the predictor variable (OQT) resulted in a significantly lower average for Negro graduates of predominantly Negro colleges, whereas Negro graduates of Caucasian colleges did not differ significantly from the Caucasians with which they were matched. Results arising from matching an OQT may be spurious, however, and limitations are offered to assist in their interpretation. Comparison of the entire Negro sample with an independent sample of Caucasian OCS graduates (N=1, 072) resulted in an OQT mean for Negroes ten points (scale of Navy Standard Scores) below that of Caucasians while on a four point scale the average OCS final grade was 2.9755 versus 3.1018 for Caucasians.

Validity coefficients for predicting OCS final grade from OQT ranged from .25 to .33 for Negroes as compared to a range of .23 to .53 for Caucasians. The coefficients observed for Negroes though lower were not viewed as indicating presence of bias. Application of the regression equation for the independent sample of Caucasians to Negro OQT scores, however, resulted in basically the same predicted OCS final grades as those actually attained. Recommendations were provided for interpretation of OQT scores for future minority applicants to OCS.

Report of Officer Findings, Navy Personnel Survey, (NPS 69-1) Attitudes and Experiences of Naval Officers Relating to Career Incentives, Retention, Education, Personal Services and Duties and Conditions of Navy Life. WSR 71-6. November 1970. 22 pp. DDC Availability No. AD 877 176. C. Braunstein.

NPS 69-1 is the seventh survey in the Navy Personnel Survey series. The NPS surveys are conducted on an annual basis to obtain information concerning the attitudes and opinions of Navy military personnel. The data is representative of the Navy officer population except for certain personnel groups excluded from the survey.

Topic areas covered by this report include service experiences and background, career motivation, career incentives, education and other Navy programs, personal services and the officers' perceptions of their wive's attitudes toward certain aspects of Navy life.

Six Year Obligor Programs: A Study of Factors Influencing Entry. WSR 71-5. November 1970. 50 pp. DDC Availability No. AD 714 840. L. A. Broedling.

This report presents the results of a study designed primarily to determine which factors induce men to enter Six Year Obligor Programs.

Survey questionnaires were mailed during February 1970 to a representative sample of men who had entered Six Year Obligor Programs since January 1966. The results were presented for the total group as well as for each of the four Six Year Obligor groups which are managed individually in the Bureau of Naval Personnel.

The chance to receive special or advanced technical training had by far the most influence on the entry decisions of the most men. The chance to do interesting, challenging work, the chance for rapid advancement, and the chance to be in a rating or program with prestige were important secondary influences. The chance to get VRB and the chance to get ProPay had only slight influences.

It was concluded that changing the present incentive structure so that VRB would be given only for a reenlistment or extension of two or more years beyond the initial six year obligation would not result in any substantial loss of applicants to the programs holding other factors equal.

The Development of an SVIB Scale for Predicting Disenrollment from the NROTC (Regular) Program. SRM 71-10. February 1971. DDC Accession Number AD 719 898. Idell Neumann and Norman M. Abrahams.

In the past few years, the NROTC (Regular) midshipmen have been voluntarily disenrolling from the program in increasing numbers. The increasing disenrollment rate results in fewer midshipmen receiving commissions and reduces the pool of potential career officers. This, coupled with the substantial monetary loss when a midshipmen disenrolls, requires the selection of those applicants most likely to remain in training and elect a naval career.

Since 1964, the Strong Vocational Interest Blank (SVIB) has been routinely administered to all applicants for an NROTC (Regular) scholarship as a means of identifying those who are career motivated. The success of this effort suggested possible use of the SVIB as a means of predicting completion of NROTC college training.

Using data from the entering classes for the years 1964-1967, several scales were constructed by contrasting the SVIB responses of midshipmen remaining in the program with those disenrolling for various reasons (motivational, academic, etc.). These scales were evaluated on a similarly constituted holdout sample.

A cross-validated biserial validity coefficient of .20 was obtained for the best empirical scale between disenrollment for any reason and remaining in the program. Under favorable conditions, this scale could eliminate 80 potential disenrollees from a starting class of 1,350 midshipmen. Such a decrease in attrition could produce a monetary saving of approximately $300,000 per year.

To determine the actual contribution use of the SVIB would make, it is recommended that the relationship between the disenrollment scale and the present selection scores be determined. This analysis will permit recommendations to be made for the operational use of the disenrollment scale.

Reliability and Predictive Validity of the Navy Vocational Interest Inventory. SRR 71-16. February 1971. DDC Accession Number AD 721 075. Alan W. Lau and Norman M. Abrahams.

Retention and job satisfaction among enlisted personnel are dependent upon men being assigned to tasks and training compatible with their interests. This report is one of a series designed to evaluate a promising classification instrument, the Navy

Vocational Interest Inventory (NVII). The present study is an investigation of the reliability and validity of the NVII for a group of men retested two years after leaving the Navy.

Previous findings on NVII test-retest reliability have been based upon the responses of reenlistees. Since reenlistment may indicate stability of vocational preferences and non-reenlistement a need for vocational change, an analysis of scale reliability for a sample of non-reenlistees is reported in the present study. A second purpose of the study is to obtain evidence for the predictive validity of the NVII.

By searching enlisted Navy personnel records in 1970, home addresses for 334 of the 754 non-reenlistees who took the NVII in 1964 were located. Completed inventories were received from 174 men (52 percent). NVII retest scores of these men were compared to scores earned six years earlier. NVII scales were also related to present civilian occupation and to self-reports of job performance and satisfaction. The relationship between reason for leaving and scale scores was also examined.

NVII scores tend to be stable whether based on responses from reenlistees or non-reenlistees. The NVII has acceptable predictive validity. Moderate relationships between NVII scores and reports of civilian job satisfaction and performance were found. Of particular interest was the finding that low scores were associated with separation from the Navy because of dissatisfaction with rating.

A Comparison of Retention of Category IVs and Non-IVs in Fifty-eight Navy Ratings. SRR 71-13. March 1971. DDC Accession Number AD 721 074. Charles H. Cory.

The advent of Project 100,000 made it especially important to determine the best means of utilizing Category IV men in the Navy. In particular it became important to learn which ratings were most suitable for these men in terms of retention. A related interest is whether IVs have generally higher retention rates than personnel in other mental levels.

The present study involved analysis of data based on the men retained from a sample of approximately 19,500 men after an average of nine years service. After categorizing them by mental level within each of the ratings present in the sample, ratings and types of ratings most suitable for IVs in terms of long term retention were determined. Ratings having few or no IVs to which IVs might be suited for assignment were identified.

Category IV personnel were found to have been retained at a substantially lower rate and to be present in substantially fewer ratings than men in the other mental levels. Despite the overall lower than average rate, for many ratings IVs had rates of retention substantially higher than other mental levels.

Navy Wives' Perceptions of Conditions of Navy Life. WSR 71-7. March 1971. 75 pp. DDC Availability No. AD 722 024. T. W. Muldrow.

This report reveals the results of a study conducted to assess the attitudes, opinions and experiences of wives of both officers and enlisted men regarding their views and perceptions of various aspects of naval service.

Questionnaires were mailed directly to a random sample of wives of 11,000 officers and 14,000 enlisted men who receive "Q" and/or "D" allotments. An additional 125,000 questionnaires were distributed in exchanges, commissaries, hospitals, and various commands.

Responses from 7,520 enlisted men's wives and 3,063 officers' wives were received in time to be processed by the cut-off date.

Seventy percent of the officers' wives and 38% of the enlisted men's wives are pleased that their husbands are serving in the Navy. Significantly, only 5% of the officers' wives are looking forward to the day their husbands leave the Navy as compared with 34% of the enlisted wives.

Both officer and enlisted wives agreed that "husband's absence from home" was the most unfavorable aspect of being a Navy wife. "Amount of husband's pay" was the second most unfavorable aspect, especially for the enlisted wife. For officers' wives, "length and/or frequency of deployment" followed closely behind "pay" as the most unfavorable aspect. Enlisted wives cited the thought of one's husband being seriously wounded or killed as the third most unfavorable aspect.

The lack of Navy dental care for dependents created a financial hardship for 60% of the officer families and 45% of the enlisted families.

A Comparison of Two Interest Inventories for Use with Enlisted Personnel. SRM 71-12. May 1971. DDC Accession Number AD 725 142. Alan W. Lau and Norman M. Abrahams.

Improved classification and assignment of enlisted personnel is intended to bring about improved retention and job performance. The present study focussed on two instruments of potential usefulness in enlisted classification, the Navy Vocational Interest Inventory (NVII) and the Strong Vocational Interest Blank (SVIB).

Previous findings have shown that the empirically derived Navy occupational keys and the more general NVII area scales effectively measured the vocational interests of Navy enlisted men. The primary consideration of this report is to compare the NVII and the SVIB in terms of which inventory does the better job of measuring the interest patterns of enlisted men.

As part of an earlier study, the NVII was administered to recruits at seven different Class "A" Schools. These schools were Hospital Corpsman, Electronics Technician, Yeoman, Storekeeper, Engineman, Machinist's Mate, and Submarine. Recently the SVIB was administered to another sample of recruits, some of whom subsequently attended one of the above schools. The homogeneous scales of the NVII and SVIB were compared to determine which inventory was most effective in differentiating the interests of enlisted men. The degree of discrimination between groups on each set of homogeneous scales was measured by the "percentage of overlap" statistic.

Although it was difficult to differentiate the interest patterns of men in closely related schools with either set of homogeneous scales, the NVII was found to be somewhat more effective than the SVIB. Before the relative usefulness of either inventory in recruit classification can be finally determined, it will be necessary to empirically develop scoring keys for the two interest inventories and compare their relative effectiveness in differentiating interest patterns. This research is currently under way.

A Comparison of the Porteus and Navy Maze Tests. STB 71-11. June 1971. DDC Accession Number AD 728 026. Charles H. Cory.

As part of the research in support of Project 100,000, an extensive test development and validation effort was begun at the Naval Personnel and Training Research Laboratory, San Diego to produce classification instruments which would be more useful for Category IV personnel than the present operational battery. One of the tests constructed as a result of this effort, the Navy Maze Test, was intended to be group-administrable equivalent of the widely used Porteus Maze Test. The present study was undertaken to compare the two maze tests psychometrically.

The study involved administration of the two maze tests to 100 Navy recruits and intercorrelation of the maze scores with the scores from operational tests and biographical variables. Conclusions were based on an analysis of the correlation coefficients and the results of a factor analysis.

The major findings of the study are as follows: (1) The Porteus and the Navy Maze Tests are measuring different types of skills and/or abilities. (2) The Porteus Maze Test does not appear to be appropriate for use with Navy recruits of mental levels higher than Category IV. (3) Since the ability measured by the Navy Maze Test does not duplicate the abilities measured by the present operational classification battery, it may serve to add to the predictive variance of the battery. (4) If the Navy Maze Test is placed into operational use, separate regression lines should be computed for Blacks and for non-Blacks.

Evaluation of a Special Recruiting Program for Junior College Graduates. WRR 71-5. June 1971. 80 pp. DDC Availability No. AD 728 392. M. W. Hoover.

Effectiveness of recruiting under the Junior College Graduate Training Program (JC) was investigated. Indicators of potential value were based on information available at beginning-of-first-enlistment. Indicators of demonstrated value were based on end-of-first enlistement achievements.

Value indicators of JC men were compared with those of men enlisted under the High School Graduate (HS) and Regular Navy Male (RR) recruiting programs. When compared with HS and RR men in the same ratings, the greater potential of JC men, seen initially in more education and higher aptitude scores, was tangibly demonstrated at end-of-first-enlistement in exceptional professional growth and frequent recommendation for reenlistment.

New Concepts in the Management of Navy Living Quarters Ashore. WRM 71-54. June 1971. 86 pp. DDC Availability No. AD 728 395. T. J. Rademaker.

The scope of the Navy housing function (appropriated fund) is identified, and qualitative/quantitative staffing standards are proposed for Consolidated Housing Offices and for Navy housing subfunctions. These standards are based upon on-site studies at Navy, Air Force and Army installations, and upon guidance obtained at academic, industrial and labor organizations, as well as through significant library research. Proposed standards for Navy bachelor housing provide both for existing levels of service and for desired levels as expressed in current official guidance. Significant management and manpower utilization problems, together with other factors affecting the overall quality of everyday life in Navy quarters, as obtained through intervies with cognizant management and operating personnel, are identified and discussed. Recommendations are made to assist Navy planners in determining manpower requirements and in developing a personnel recruitment and training program for effective and up-to-date management and operation of Navy housing.

Prediction of Enlisted Performance: I. Relationships Among Aptitude Tests, Navy School Grades, The Report of Enlisted Performance Evaluations, and Advancement Examinations. STB 71-10. June 1971. DDC Accession Number AD 728 025. Ervin W. Curtis.

The major purpose of this research was to analyze the components of final grades in Class "A" schools and to relate grades to subsequent on-job performance and advancement examination scores.

A battery of 11 "factor pure" aptitude tests was administered to enlisted students at 19 technical schools in 11 Navy ratings. Each student's complete grade record was obtained, consisting of scores on all written and performance examinations, the number of failing subgrades received, and final grade. About two years later official on-the-job performance evaluations and advancement examination scores were obtained for about 3,000 of the 4,451 sample members.

Final grade was quite reliable for nine of the schools, and marginally reliable for the remaining 10 schools. Morse Code and Teletype subgrades were less reliable. The weights applied to subgrades in computing final grade usually reflected the statistical contributions ("effective" weights) the subgrades made toward final grade. The Basic Test Battery (BTB) was a better predictor of final grade than of failure (substandard grades). In addition, the choice of selector tests for each school has not been optimum for predicting failure. Correlations between final grade and total score on the Navy performance evaluation form (NAVPERS 792) were generally significant but low. No aptitude test showed much promise for predicting total score on the NAVPERS 792. Advancement examination scores correlated substantially with many of the aptitude tests, with many school subgrades, and with final grade for most of the schools.

It was recommended that the Associative Memory Test be added to the BTB.

A Comparison of the Performance of Fleet and Recruit Input to Class "A" Schools. STB 72-1. July 1971. DDC Accession Number AD 728 027. Patricia J. Thomas.

Validity studies of the Navy Basic Test Battery (BTB) are usually performed with Class "A" school samples to evaluate the effectiveness of the tests as school selectors. Source of student input is rarely a research variable and the same BTB cutting scores used in recruit classification also apply in the selection of fleet students. This study was conducted to determine whether BTB validities differ for these two groups and whether test composites appropriate for recruits are valid for fleet applicants.

The analysis was based on 130,000 grade cards, which were divided into recruit and fleet input to 82 schools. Validities of six BTB tests and four selection composites were computed for each sample. Differences between mean selector scores, mean final grades, and validities were tested for significance.

Significant differences between fleet and recruit school input were found for all variables tested. In nine of the ten comparisons the tests were more valid predictors of the school performance of recruit input than of fleet input. In addition, students from the fleet generally entered with lower selection scores and graduated with higher final school grades. It was concluded that factors other than those measured by the BTB are having a greater effect on the school performance of students from the fleet.

The following recommendations were made: (1) BTB cutting scores should be made lower for fleet than recruit input to Class "A" schools; (2) The number of fleet students in A-Schools should be increased; and (3) Research should be undertaken to determine the effectiveness of alternate methods for selecting fleet men.

Overseas Homeporting Study, Phase II, Reactions of Dependent Navy Personnel Toward Overseas Homeporting, Quantitative Analysis. WSR 72-4. July 1971. 40 pp. DDC Availability No. C. Braunstein.

This report investigates the frustrations, problems and rewards experienced by Navy dependents overseas. Their adjustment is assessed and their willingness to accompany their husbands overseas is determined.

A structured multiple choice questionnaire was developed and administered to dependent wives in London, Holy Loch, Rota, Naples, Gaeta, Nea Makri, Sasebo, and the Kanto Plains area in Japan. A total of 481 officers and 647 enlisted respondents wives were queried.

Most wives stationed in non-English speaking countries were able to speak at least simple words and phrases in the local language. Approximately half the wives found housing overseas to be worse than they expected. Satisfaction with dispensary and dental clinics differed at each location. The majority of wives were satisfied with foods and products sold in commissaries and exchanges. Almost all of them indicated that they would be able to at least "make do" with locally available foods and products. Mothers whose children attended military dependent schools differed widely in their assessments of these schools. The great majority of officer wives and two thirds of the enlisted wives were satisfied with life at their overseas locations. Most wives would be willing to accompany their husbands to almost any place other than the Philippines.

Assessment of Attitudes and Motivations of Category IV Marginal Personnel. WRR 72-1. August 1971. 58 pp. DDC Availability No. AD 729 250. M. Goldsamt.

The purpose of this longitudinal research is to identify the motivational behavior and attitudinal characteristics of category IV marginal personnel and: (a) ascertain how these characteristics assist in adapting to the Navy while determining if (b) Navy experiences prepare these men for the "civilian world". This report presents results of two additional assessments made upon and completion of recruit training.

The study group of 1,837 enlisted men consists of 1,340 upper category IV (AFQT 16-30) and 497 lower category IV (AFQT 10-15) men. The total cohort has a median age of 18.5 and mean AFQT score of 19. Demographic results in this study parallel other research findings as to: the large family sizes, disadvantages socio-economic backgrounds, ethnic composition and unskilled character of family occupational history.

Category IV men joined the Navy because they saw it as more of a personally rewarding environment than civilian life. These men primarily joined to obtain technical training. However, wanting to travel, obtain time to resolve their lives, serve one's country and not wait until drafted also strongly affected enlisted decisions. Men thought that in the Navy they could do the work they liked best, work on important jobs and obtain fairer treatment. Lower category IV men seem to be more drawn to the Navy and besides are more satisfied with recruit training than upper category IV men. At entry into the Navy, category IV men were socially interactive, self-confident and self-assertive but pessimistically viewed their future expectations. About 25% feel unqualified for the general apprenticeship they received; 49% said it was not the one they wanted.

Overseas Homeporting Study - Phase II, Reactions of Dependent Navy Personnel Toward Overseas Homeporting - Qualitative Analysis of Interview Protocols. WSR 72-2. August 1971. 114 pp. DDC Availability No. AD 889 091L. S. A. Weinberg, R. R. Allen, and J. D. Wichlac.

The United States Navy is conducting extensive investigation on the feasibility of supporting homeporting programs abroad for its personnel and their dependents. This study aims to report on one phase of the research program by presenting the results of interviews with the wives of Navy personnel living abroad with their husbands. Underlying this research program would be the increased potential for a more congenial family life together as well as a more attractive career program. With shorter runs under way to homeports, Navy personnel would be able to spend more time ashore with their families.

The major instrument in this study was a 70 item, structured and open-ended interview schedule. Interviews were conducted at the interviewees' current locations. The sample consisted of 76 Navy wives in nine different overseas locations. Responses were content analyzed.

Most interviewees stated that they would go overseas with their husbands to the six sites suggested as options. Most interviewees were satisfied with their lives overseas. Their most rewarding experience was the opportunity to travel and to learn about other people. The wives generally reported that they were well treated by the host nationals. They pinpointed five areas which were crucial to making an overseas adjustment and with which they were dissatisfied: schooling, housing, medical services, commissaries, and post exchanges.

Overseas Homeporting Study, Phase II, Reactions of Naval Personnel Toward Overseas Homeporting. WSR 72-3. August 1971. 180 pp. DDC Availability No. AD. L. A. Broedling and A. Katz.

This report analyzes responses to questions on overseas homeporting included in the Naval Personnel Survey, NPS 71-1. These questions solicited opinions on such topics as an overseas homeporting proposal, willingness to volunteer for duty on a ship homeported overseas where supportive services would be available and where they would not be available, and influence on service career plans of being ordered to either type of duty assignment.

A large majority of officers and enlisted men favored the overseas homeporting proposal. Support for the proposal was greater among officers than enlisted men and among married personnel more than single. Officers were somewhat more likely than enlisted men to volunteer for homeporting either with or without supportive services. With supportive services, more married than single personnel would volunteer for homeporting. Without these services, the reverse would be more likely to occur.

The effects on career plans of being ordered to duty on an overseas homeporting ship both with and without supportive services are discussed.

The Use of a Vocational Interest Test in Recruiting Minority and Casucasian Officer Candidates: An Exploratory Study. SRM 72-3. August 1971. Patricia J. Thomas and Bernard Rimland.

An informal exploratory study was conducted to evaluate the possibility of using vocational interest tests to identify potential career naval officers from a population of high school boys. A major focus of the study was the recruitment of minority group members for the officer corps.

Approximately 500 eleventh grade males in a number of San Diego high schools were tested with the Strong Vocational Interest Blank (SVIB). The students' scores on the various occupational scales (e.g., doctor, accountant, carpenter, etc.) were provided to the counselors for use in vocational guidance. The SVIBs were also scored on scales specially developed by this Laboratory for identifying career-oriented Navy officers. Relatively high scores on these Navy scales were earned by 100 boys, 33 of whom are minority group members. Interviews were arranged for these students with a Naval Academy Information Officer. About 40 of the boys interviewed, including 12 minority members, indicated a positive interest in a Navy career. Many of these had not previously considered the possibility of a Navy career.

Although no followup has yet been possible, this pilot study appears to provide a promising approach toward identifying Navy career-oriented young men.

An Evaluation of Methods for Predicting Job Performance of Personnelmen. STB 72-4. September 1971. Patricia J. Thomas.

The Personnelman (PN) rating was the subject of a recent study in which selection test scores were found to correlate satisfactorily with school grades. The purpose of this follow-up study was to determine: (1) correlations between selection test scores and job performance measures; and, (2) if the experimental tests taken by PN students in school are related to performance in the PN rating.

Performance evaluations were obtained for PNs six months after graduation from the Report of Enlisted Performance Evaluation (NAVPERS 792) and from an experimental Personnelman Supervisor's Questionnaire. Basic Test Battery (BTB) scores, experimental test data, and school grades were validated against these criteria. Comparisons were made among four samples of graduates and between fleet and recruit input to the schools.

Peer Ratings, Instructor's Ratings, and Final School Grades (FSG) were substantially related to job performance ($\underline{r}$s ranged from .23 to .35 with the total sample and achieved .60 in one school). The BTB tests used in school assignment also significantly correlated with job performance ($\underline{r}$s ranged from .14 to .19). None of the experimental memory tests nor either of the vocational interest scales were consistently correlated with the criteria to a significant degree.

It was recommended that no change in PN selection tests or qualifying scores be made and the PN graduate and his next billet be carefully matched. The latter recommendation could be accomplished by ranking duty assignments on the basis of required excellence of PN performance and assigning students with the highest Peer Ratings (or combination of Peer Rating, Instructor's Rating, and FSG) to the more demanding jobs.

A Monte Carlo Study of the Sampling Distribution of the Likelihood Ratio for Mixtures of Multinormal Distributions. STB 72-2. September 1971. DDC Accession Number AD 731 039. John H. Wolfe.

Samples from spherical normal distributions were generated and fitted to hypothesized mixtures of normal distributions using the 360 NORMIX computer program for maximum likelihood estimation of the parameters of a mixture of multinormal distributions with a common covariance matrix. The results suggest that the logarithm of the likelihood ratio, when multiplied by the coefficient $-\frac{2}{N}(N-1-m-\frac{r}{2})$ is distributed approximately as chi-square with degrees of freedom twice the number of variables times the difference in the numbers of hypothesized clusters.

NORMIX 360 Computer Program. SRM 72-4. September 1971. John H. Wolfe.

This report gives the documentation, listing, and printouts of a sample run for the NORMIX 360 computer program. The program seeks maximum-likelihood estimates of the parameters of a mixture of multivariate normal distributions. The likelihood equations are solved iteratively by continually re-estimating the probability of membership of each sample point in each cluster until the likelihood reaches a relative maximum. The initial estimates are derived from a minimum-variance hierarchial grouping subroutine, which itself is iterative in seeking an appropriate distance function. The program prints out the means, standard deviations and intercorrelations of the variables within clusters, and the proportions of the population for each cluster. The probabilities of membership of each point in each cluster are also printed.

The Perceived Effectiveness of Recruit Training on Personal Adjustments to Conditions of Navy Life. WSR 72-6. September 1971. 42 pp. DDC Availability No. AD 888 463L. L. A. Broedling and M. R. Goldsamt.

This report assesses the effectiveness of recruit training in facilitating various attitudinal, psychological and behavioral adjustments men undergo during the transition from civilian life into naval enlisted ranks.

Questionnaires were mailed during January 1971 to men who had been out of recruit training a median length of 18 months.

Results showed that recruit training graduates view it as a generally valuable preparation for Navy life. They also see recruit training as having prepared them for most of the specific adjustments necessary on their first duty assignment. Those who benefited most from recruit training had one or more of the following characteristics: hold positive attitudes toward the Navy; think of their assignment as exciting; challenging or interesting, intend to reenlist at least once more; are minority group members; have come college education.

General military training was regarded as the most valuable aspect of recruit training, followed by general seamanship training, orientation in each man's rating and physical training. Although some specific areas warrant improvements, increased stress or decreased stress, it generally was concluded that recruit training is effective in promoting necessary attitudinal and psychological adjustments.

Personnel Reactions to Incentives, Naval Conditions and Experiences (PRINCE), Demographic and Background Information Expectations, Attitudes, Values and Motivations of New Recruits. WRR 72-2. September 1971. 32 pp. DDC Availability No. AD 731 046. A. Katz.

As part of a longitudinal study of the reactions of enlisted men to personnel incentives, naval conditions and experiences, information on backgrounds, expectations, attitudes, values and motivations were obtained at entry into the Navy from 6,795 recruits in categories I, II, and III on AFQT.

New recruits see the Navy more frequently as an environment in which they can satisfy some short term goal. The single most important reason for joining the Navy was: to get technical training, need of time to find out what they wanted to do with their lives, and not wanting to wait until they are drafted.

On the basis of a comparison of: (1) their educational achievement to date with that of their parents, and (2) their occupational goals with the current occupations of their fathers, it appears that many recruits are interested in upward social mobility.

The Assessment of Career Motivation Among NROTC Applicants with the Strong Vocational Interest Blank. SRR 72-9. October 1971. Norman M. Abrahams and Idell Neumann.

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The majority of NROTC commissioned officers leave active duty shortly after completing their minimum service requirement. The purpose of this research is to evaluate an empirical retention scale, based on the Strong Vocational Interest Blank (SVIB) for use in selecting those NROTC (Regular) applicants most likely to remain on active duty beyond the minimum period required.

Since 1964 the SVIB has been administered to various groups, including NROTC applicants, NROTC officers, Naval Academy midshipmen, and Naval Academy officers, among others. A comparison of the SVIB responses of high and low tenure NROTC officers yielded an empirical retention scale that has been evaluated in terms of predictive effectiveness, reliability, and fakability, and has been operationally used.

The wide variety of validity, reliability, and fakability data collected on the SVIB N-6 scale consistently support the hypothesis that the scale does measure career motivation.

On the basis of information now available, it is recommended that the SVIB N-6 scale continue to play a major role in the selection of candidates for officer training.

Comparative Cluster Analysis of Patterns of Vocational Interest. STB 72-3. October 1971. John H. Wolfe.

Published data on the Strong Vocational Interest Blank profiles of 113 occupational groups are analyzed by three different clustering procedures: (a) Hierarchical grouping of standard scores, (b) Hierarchical grouping of principal axis factor scores and, (c) NORMIX analysis assuming equal covariance matrices for each group. It is shown that the NORMIX solution differs from the other solutions in a psychologically meaningful way.

Evaluation of the Strong Vocational Interest Blank as a Screening Device for NESEP Applicants. SRM 72-6. October 1971. Norman M. Abrahams and Idell Neumann.

The Navy Enlisted Scientific Education Program (NESEP) provides qualified enlisted men with an opportunity to obtain a college degree while earning a commission as an officer in the naval service. Although NESEP's mission is to provide scientifically trained officers in the unrestricted line billets, an increasing number of NESEP officers reportedly request restricted line billets after receiving their commissions.

A screening device capable of identifying those NESEP applicants who would prefer a career in the unrestricted line would be useful in reducing this problem. Since the choice of a restricted or unrestricted billet may be considered an occupational preference, it seemed appropriate to consider the use of an interest inventory for screening NESEP applicants.

In 1965, over 250 NESEP selectees completed Strong Vocational Interest Blanks (SVIBs). For the 166 who had received commissions by 1971, the SVIB mean scores of those officers who were either in or had requested restricted line or staff billets were compared with the mean scores of the unrestricted line group. These comparisons revealed that NESEP officers who request or are actually in restricted line or staff billets obtain significantly higher scores on the physical science scales. While the SVIB could thus be used for differentiating between these groups, its use in screening would require selection of applicants with relatively low science interest scores. Since this procedure could lead to a decrement in the academic performance of selectees and possibly lower the number and quality of NESEP graduates, further research would be necessary before operational use could be recommended. It is further recommended that consideration be given to expanding the concept of NESEP to include management science training. Several advantages for such a program are indicated.

The Navy Advisory Profile Report. WRR 72-5. October 1971. 84 pp. DDC Availability No. AD 732 754. T. M. Yellen and J. F. McGanka.

The purpose of this research was to develop an instrument which would be used to assess an individual's potential and suitability to perform advisory functions in the Republic of Vietnam. An experimental evaluation instrument and instruction manual were developed incorporating the distinguished characteristics and their operational definitions. The form and manual were field tested and an analysis in discriminating between effective and ineffective individuals as potential advisors. The Navy Advisor Profile Report (NAVPERS 1300/8 (7/71) and BUPERS 1300-24) and the instruction manual, Navy Advisor Profile Report (NP 15164) were put into fleet-wide operational use in August 1971.

A Comparison of Four Methods of Selecting Items for Computer Assisted Testing. STB 72-8. December 1971. Rebecca Bryson.

Four methods were used to select items for shortened versions of the Navy General Classification Test (GCT) and the Navy Mechanical Aptitude Test (MECH). Two of these methods were used to produce short linear tests, and two to produce short branching tests. Item response data banks were used for simulated administration of all short tests. Obtained scores were then correlated with full length test scores. Navy recruits' item responses were used throughout. Additional recruit samples were used for administering short tests in paper-and-pencil form and short branching tests via computer terminal. Correlations with previously administered full length tests were obtained.

It was found that (1) When item response data banks were used for simulated item administration, one approach requiring branching (Wolfe's BRANCH method) appeared superior to the other three approaches for developing short GCT and MECH tests which paralleled the full length tests. (2) When short linear tests were administered in paper-and-pencil form and short branching tests were administered via computer terminals results were less clear-cut. For producing results which parallel long test score, one linear approach (Moonan's SEQUIN) appeared as good as and, in some comparisons, superior to the two branching approaches. (3) Mode of item administration (paper and pencil vs. computer) appeared to have an effect on test score. It is at least possible that computer terminal testing would result in a loss of predictive efficiency when tests are used to predict external criteria.

Enlisted Men's and Officer's Opinions of Recent Policy Changes Implemented Through Z-Grams. WSR 72-5. December 1971. 160 pp. DDC Availability No. AD 890 863L. G. L. Wilcove.

The study was conducted to determine the acceptance of recent policy changes implemented by "Z-Grams" or, more specifically, how the changes affected perceptions of the attractiveness of Navy life, morale, job satisfaction, and Navy career plans.

Multiple choice questions were developed as part of the NPS 71-1. Questionnaires were mailed to enlisted men and officers, with data eventually being available for 5,616 officers and 11,933 enlisted men.

Both officers and enlisted men believed that Navy life had been improved by changes in leave and liberty privileges, personal services, regulations, and family services. Officers alone believed this way about changes in equal rights opportunities and retention programs, while enlisted men believed this way about changes in living and housing conditions. Officers reported that changes in living and housing conditions had not appreciably improved life while enlisted men reported the same about changes in equal rights opportunities and retention programs. Both enlisted men and officers indicated that changes in job and career development programs had not appreciably improved Navy life. Other findings showed that first enlistees were less favorable to the changes than other enlisted personnel, and that differences in reaction existed between enlisted men and officers in particular areas of policy changes.

Evaluation of the Test of the New System for Administration of the Annual Family Housing Survey. WRM 72-16. December 1971. 38 pp. DDC Availability No. AD 735 470. L. A. Broedling.

This study involved the development of a new system for administration of the annual family housing survey, and an evaluation of the test of the new system.

The Naval Facilities Engineering Command is responsible for coordinating an annual survey of family housing which is used to determine military family housing requirements. The present survey system involves use of a questionnaire which must be keypunched and administration of these questionnaires by monitors during group sessions. This system is both time-consuming and costly. The new system involves use of a questionnaire which is suitable for optical scanning and administration of these questionnaires through the mail.

The new survey system was tested in conjunction with the CY 71 operational family housing survey at six different locations. The results of the test showed that, while use of the new system is feasible, further improvements first must be made in the questionnaire itself and in the mailing procedures. It was recommended that, after the necessary improvements are made, the new system be field-tested in conjunction with the CY 72 operational survey.

The Relationship Between Navy Classification Test Scores and Final School Grade in 104 Class "A" Schools. SRR 72-15. January 1972. Patricia J. Thomas.

The Basic Test Battery (BTB), a primary determinant of post-recruit school assignments, requires periodic evaluations. This graphic report of the effectiveness of the BTB selection composites is a simplified presentation of an extensive statistical analysis completed in 1970.

Final School Grades (FSG) were employed as the criterion. Validities of the BTB composites were compared with those obtained two years previously. Graphs depicting the relationship between selection composites and FSG were prepared for each of the 104 schools. Rates of academic attrition were also computed.

The correlations between school grades and selection scores were generally higher than those reported previously; and, in the majority of cases, the higher the test scores, the more likely the student is to score above the median FSG in his school. The attrition rate was unusually high in six schools, even among students whose BTB scores were 10-14 points above the operational selection cutting score. The grades of the majority of men who were assigned to the schools despite substandard BTB scores were satisfactory and the preponderance of these lower aptitude men graduated.

Continued use of the BTB in recruit classification is indicated. Since most men entering schools with test score waivers are able to graduate, the advisability of lowering test cutting scores should be investigated. In addition, studies should be conducted at schools with high attrition rates to determing whether changes in selection and/or training are needed.

Report of Enlisted Findings, Navy Personnel Survey NPS 71-1. WSR 72-7. January 1972. 29 pp. DDC Availability No. AD 737 254. C. Braunstein.

NPS 71-1 is the ninth survey in the Navy Personnel Survey series. The NPS surveys are conducted on an annual basis to obtain information concerning the attitudes and opinions of Navy military personnel. The data is representative of the Navy enlisted population except for certain personnel groups excluded from the survey.

Topic areas covered by this report include service experiences, and background career motivation, career incentives, advancement, new policies and programs, personal services, and Navy general mess facilities.

Report of Officer Findings: Navy Personnel Survey, NPS 71-1. WSR 72-9. February 1972. 21 pp. DDC Availability No. AD 738 441. C. Braunstein.

NPS 71-1 is the ninth survey in the Navy Personnel Survey series. The NPS surveys are conducted on an annual basis to obtain information concerning the attitudes and opinions of Navy military personnel. The data is representative of the Navy officer population except for certain personnel groups excluded from the survey.

Topic areas covered by this report include service experiences and background, career motivation, career incentives, education and other Navy programs, new policies, and personal services.

Report of Officer Findings: Navy Personnel Survey, NPS 70-1. WSR 72-8. February 1972. 26 pp. DDC Availability No. AD 744 932. C. Braunstein and T. Muldrow.

NPS 70-1 is the eighth survey in the Navy Personnel Survey series. The NPS surveys are conducted on an annual basis to obtain information concerning the attitudes and opinions of Navy military personnel. The data is representative of the Navy officer population except for certain personnel groups excluded from the survey.

Topic areas covered by this report include service experiences and background Navy information sources, Navy publications, career motivation, career incentives, education and other Navy programs, personal services and the officers' perceptions of their wives' attitudes toward certain aspects of Navy life.

Situational Factors in Navy Enlisted Performance Evaluation. STB 72-9. March 1972. DDC Accession Number AD 744 942. Marjorie H. Royle, Jim James, and David W. Robertson.

The Enlisted Performance Evaluation System is important to individual personnel actions such as advancement, job assignment and retention. It is thus essential that any possible sources of error in marking practices be removed or reduced. When performance marks vary as a function of such "situational factors" as type of command or time on job, the variation may reflect either true performance differences or error from differences in marking standards. The purpose of this study was to investigate the magnitude of certain situational differences in enlisted performance evaluation.

The following situational differences were analyzed within job-specialty and pay grade: Size of command, rank of commanding officer, location and deployment, type-command, time-on-board, and job specialty by deployment and type-command. The data were taken from the operational NAVPERS 792 Performance Evaluation Forms (N=30,000).

Some significant, although usually small differences were found at the lower pay grades, while fewer were found at the higher pay grades: The insensitivity of the form to differences between superior and typical performance at the higher pay grades, where advancement opportunity is quite keen, seems likely to result in inequities; the smallest units tended to assign the highest marks; deploying units had lower marks than shore units with exceptions for some ratings; and marks increased with the length of time ratee was assigned to a unit.

Although only about one to five percent of the variation was found to be accountable by each situational factor analyzed separately, the aggregate from all factors could be substantially higher.

Source Documents for the Automated Enlisted Performance Evaluation System. SRM 72-10. March 1972. DDC Accession Number AD 740 083. David W. Robertson.

Conceptual and methodological approaches employed in research on improving the Navy performance evaluation system are discussed, including: Selection and definition of items, relative vs absolute marking scales, behavioral anchor methodology, and statistical standardization of evaluation marks. A technique developed at this Laboratory, the model anchor, is described. This method employs numerous means for orienting the rater to mark the average (i.e., "Typical") ratee in the middle of the marking scale.

This material was originally prepared for a presentation to the Personnel Management Improvement Committee (PMIC) of the Bureau of Naval Personnel in June 1970. Since much of the information presented has not been incorporated in other reports of this Laboratory, and a number of requests for copies have been received, it is published at this time as a Research Memorandum.

Feasibility of Computer-Generated Data Displays in the Automated Performance Evaluation System. SRR 72-20. April 1972. DDC Accession Number AD 740 086. David W. Robertson, Jim James and Marjorie H. Royle.

A method for providing selection boards and detailers with a timely and accurate evaluation of individual on-job performance is essential if valid decisions are to be made in selecting individuals for advancement, duty-assignment, training or quality retention. Four formats and data sets are presented which demonstrate the feasibility and utility of computer-generated displays of performance evaluation data.

Data from the automated NAVPERS 1616/8 Pay Grade E-7/8/9 Evaluation Report, an Optical Mark Reader (OMR) type document, were electronically processed for the total Navy CPO population and sorted by unit-command. Unit averages and frequency distributions were then computed. The data displays generated included: Identification of units submitting inflated marks, histograms for all units submitting four or more evaluation reports, and statistically standardized marks for individual E-8/9 candidates for advancement.

Automation of the Enlisted Performance Evaluation System provides new capabilities, virtually unattainable in a manual system, which range from simply screening the population for men with extremely high or low marks through quick-response statistical adjustment and display of marks. Computer-generated data displays have demonstrated the feasibility and usefulness of the automated system both in making specific personnel selection decisions and in monitoring performance evaluation marking practices. Although such displays can present either raw or statistically standardized data, users regard the latter as being more useful.

The Relationship Between Navy Classification Test Scores and Final School Grades in 98 Class "A" Schools. SRR 72-22. April 1972. DDC Accession Number AD 741 688. ~~Patricia J~~. Thomas.

The Basic Test Battery (BTB), an important tool in the Navy's enlisted classification system, has been developed to predict performance in Navy schools. Men scoring well above the minimum selection scores are expected to demonstrate greater school success than those who are assigned to the schools with minimum or waivered scores. The purposes of this report were to determine if the BTB is meeting this goal and if the findings of similar reports covering earlier time periods hold true for recent samples.

Grades collected between January 1969 and January 1971 from almost all "A" Schools were employed as criteria. Validities of the selection test composites were compared with validities obtained from samples collected two years previously. Graphs depicting the relationship between selection composites and school grades were prepared for each of 98 schools. Academic attrition percentages were computed for the data available from each school.

The major findings were: (1) The correlations between school grades and scores on selection composites were generally higher than those reported previously. (2) The grades of the majority of men who were assigned to the schools despite substandard BTB scores were satisfactory. Ninety-five percent of these relatively low-aptitude men graduated from the Class "A" school assigned. (3) The attrition rate was unusually high in three schools, even among students whose BTB selector test scores were 10-12 points above the operational score.

It was concluded that the results of the previous reports concerning the BTB validities were substantiated. Changes in the cutting scores for certain schools should be considered.

An Evaluation of Two Non-Intellective Measures as Predictors of Performance in the Avionics Technician Course. SRM 72-12. May 1972. Kirk A. Johnson and Haskel Hoine.

Two non-intellective measures were evaluated as means for predicting performance in the Avionics Technician Course. An experimental scale based on the Michigan State General Self-Concept of Ability to Learn (SCOAL) scale was found to be as good as the best measures of aptitude in predicting final average ($r = .57$). The combination of this scale and final average in a previous course with the measure of aptitude that is currently being used for predictions yielded a multiple correlation of .66.

A Moderator Variable Approach to Predicting Navy Families' Satisfaction with Living Overseas. WTB 72-2. May 1972. 40 pp. DDC Availability No. AD 743 481. M. R. Goldsamt.

This study utilized 14 predictor variables in a stepwise multiple linear regression model with individual and joint moderator variables to predict overall satisfaction with living at overseas sites. Data from wives of 449 officers and 1,452 enlisted men were employed. Rate/rank and extent of prior homeporting experience were used as moderators.

The variables which emerged from several optimal regression composites as being most productive of overseas satisfaction were: treatment of host country nationals, availability of recreational facilities, congruence between homeporting expectations and reality, and quality of housing. Seven in nine factors optimally predicted satisfaction. These predictors seemed more effective for enlisted men than for officers, as higher multiple correlations (.636 vs. .577) were obtained. The multiple correlation coefficient for the total sample of 1,901 men was .641.

The two moderator variables used did not differentially account for predicted criterion variance. Survey questionnaire responses, however, seem capable of being used in a multiple regression framework.

The Values of Junior Officers. Part II: The Relationship Between Career Values and Retention. SRR 72-23. May 1972. Idell Neumann, Norman M. Abrahams and William H. Githens.

A continuing Navy goal is the retention of high quality officers in numbers commensurate with the Navy's needs. The accomplishment of this goal requires increased attention to the task of satisfying the career needs of junior officers.

In 1966, a 25-item Career Value Questionnaire was administered to active duty NROTC officers. Each item was rated on its importance as a vocational reward and its perceived obtainability in the Navy. The purpose of this study is to relate these responses to tenure status.

Two types of scales were developed: (1) a rational set of scales based on Herzberg's two-factor theory, and (2) an empirical set of scales to maximize differentiation between high and low tenure officers.

Congruence between and across importance and obtainability hierarchies (based on median scale ratings for each item) was investigated for high and low tenure officers.

The empirically-derived scale utilizing both importance and obtainability ratings was highly related to tenure ($r =$ .55 and .54). While high and low tenure officers agree in their ratings of the importance of the various work rewards, they tend to disagree in their perceptions of the obtainability of many of the most important rewards. Of the rewards considered most important by the low tenure officers, the following were considered the least obtainable: success through ability along, full use of abilities, satisfactory home life, and work under consistent and intelligent personnel policies.

These findings will be of interest to those concerned with the formulation of policies intended to improve the retention of junior officers.

Personnel Reactions to Incentives, Naval Conditions and Experiences: A Longitudinal Research Study. WRR 72-8. June 1972. 34 pp. DDC Availability No. AD 745 312. A. Katz and J. Schneider.

This report is the second in a series of reports from a longitudinal study of enlisted men's reactions to incentives, naval conditions and experiences. Data were collected from 6,795 men in AFQT categories I, II, and III at the end of recruit training. The report describes: (a) Navy recruits' perceptions and evaluations of their recruit training, (b) experiences in recruit training, (c) changes in perceptions of attainment opportunity for 21 work and non-work related factors during recruit training, and (d) career and reenlistement intentions.

In general, approximately five times as many recruits were favorably impressed than unfavorably impressed with Navy life when they completed recruit training. Opinions of conditions in recruit training were more positive than negative. Data indicated that four of the five areas of recruit training where the men anticipated experiencing difficulty were evaluated as not actually causing problems. Perceptions of the opportunity for attaining the 21 factors in the Navy relative to attainment opportunities in civilian life decreased over the recruit training period. The percentages of men who expressed career and reenlistment intentions in favor of the Navy increased from entry to the end of recruit training.

The findings were interpreted as being helpful for managers of recruit training in their attempts to improve conditions of recruit training. Additionally, suggestions were made for the examination of other variables which have conceptual implications for career motivation decisions.

Effect of Anonymity on Return Rate and Response Bias in a Mail Survey. WTR 73-2. July 1972. 20 pp. DDC Availability No. AD 746 478. C. Fuller.

Naval officers who were instructed to identify their answer sheets to a mail survey were more likely to return their answer sheets and were more likely to endores pro-Navy attitude statements than were officers who did not identify their answers. The differences in questionnaire responses were low in relative frequency and small in magnitude. There were no differences in return rate or questionnaire responses between the anonymous and the identified enlisted men. It is concluded that identification appears to have little effect upon the nature of answers to questionnaire items and anonymity may decrease response rates for certain groups. When the investigator can protect his respondents against invasion of privacy, it is recommended that survey respondents be identified.

Report of Enlisted Findings Navy Personnel Survey NPS 70-1, Attitudes and Experiences of Navy Enlisted Personnel Relating to Living Conditions on Board Ship, Navy Housing and Facilities, Career Incentives, Assignments, Advancements and Navy Information Sources. WSR 73-1. July 1972. 213 pp. DDC Availability No. AD 746 477. C. Braunstein.

NPS 70-1 is the eighth survey in the Navy Personnel Survey series. The NPS surveys are conducted on an annual basis to obtain information concerning the attitudes and opinions of Navy military personnel. The data is representative of the Navy enlisted population except for certain personnel groups excluded from the survey.

Topic areas covered by this report include service experiences and background, career motivation, career incentives, shipboard habitability, Navy information sources, Navy publications, personal services, and the Navy men's perceptions of their wive's attitudes toward certain aspects of Navy life.

An Equilibrium Flow Model of the Navy's Enlisted Personnel Rotation Process. SRR 73-3. August 1972. Norman I. Borgen, Jerry A. Segal and Robert P. Thorpe.

The periodic rotation of enlisted personnel between sea duty and shore duty assignments is a firmly established Navy policy. The efficiency of this process affects the readiness of operating units and the morale of the individual Navy man. This report describes a computerized model of the rotation process which will provide rotation managers in the Bureau of Naval Personnel with a quantitative basis for decisions, and a capability for the test and evaluation of rotation policy. The model encompasses the basic variables and parameters governing the movements of personnel between the broad categories of sea duty and shore duty. The model is based on an "equilibrium flow" concept (i.e., the movements of personnel should be such that the relative proportions of personnel in the sea and shore composites will remain stable) and incorporates certain techniques of actuarial science to estimate the size of future "rotation eligible" populations. The model has been used to test how changes to tour lengths and billet structures would contribute to more orderly and equitable rotation of personnel. Examples of these and other potential application are given.

An Investigation of Possible Test Bias in the Navy Basic Test Battery. STB 73-1. August 1972. DDC Accession Number AD 749 697. Patricia J. Thomas.

This research investigated whether racial bias exists in the Navy Basic Test Battery (BTB), used to assign recruits to technical schools. BTB scores and school grades were obtained for approximately 105,000 whites and 2,000 blacks attending A-Schools in 1969-1970. Sufficient numbers of blacks attended 24 schools for statistical analysis of their test scores and standardized school grades.

The findings and conclusions were as follows: (1) The means of the white and black samples were significantly different for both the school grade criterion and the predictor tests, with whites scoring higher than blacks on all variables; (2) The regression lines of each race differed significantly. If single BTB tests were used in selection, overprediction of minority performance would be somewhat more common than underprediction; (3) The tests more accurately predicted the grades of white students than of black. The selection composites were valid predictors of the performance of white students in all schools and for black students in half of the schools.

It was recommended that: (1) No general raising or lowering of test cutting scores for school selection of minority group members appears warranted; and (2) Since the tests are not as valid for blacks as for whites, it is necessary to develop improved tests and/or use different combinations of existing tests. Meanwhile, changes in selection test combinations suggested in this report should be implemented.

A Model of Human Decision Making: Preliminary Research. WTR 73-5. August 1972. 46 pp. DDC Availability No. AD 748 596. R. N. Harris.

This research is the initial work in a program whose goal *is development of a model of human decision making which also* incorporates the relationships between the decision making function and other system functions.

Two classes of findings are reported. The first class of findings is a review of the Bayesian decision making literature. This literature has been reviewed in terms of major variables which influence decision making.

The second class of findings includes descriptions of two models of decision making processes. The first is a general conceptual model of decision making in a system context. The decision making model to be developed will be based on modifications of the conceptual model. The second model is a model of data-decision relationships. A method for development of data-decision models was outlined. This methodology was developed to meet a major problem in simulation of decision making.

The Strong Vocational Interest Blank as a Predictor of Retention in the NOAA Officer Corps. SRR 73-5. August 1972. Idell Neumann and Norman M. Abrahams.

The retention rate of National Oceanic and Atmospheric Administration (NOAA) officers is somewhat lower than desired for the efficiency of the organization.

The present study was undertaken by the Naval Personnel and Training Research Laboratory, San Diego (NPTRLSD) in response to a request for assistance from NOAA. This Laboratory has successfully completed similar efforts, using the Strong Vocational Interest Blank (SVIB), in improving the selection of career motivated naval officers.

The SVIB and a background questionnaire (BQ) were administered to samples of retired, resigned, and active duty NOAA officers. The BQ responses were used to identify low tenure active duty officers who had not yet reached the career decision point. An empirical tenure scale was constructed by contrasting the SVIB responses of a portion of the high and low tenure officers. This scale was subsequently cross-validated on the remaining sample. In addition, the mean scores for the high and low tenure officers were obtained for each of the 56 standard occupational interest scales to construct and compare occupational profiles.

A number of the standard SVIB occupational interest scales were found to discriminate between high and low tenure NOAA officers, indicating that these two groups differ in their career interests (pg.4). Further analyses resulted in the construction and cross-validation of a highly predictive empirical SVIB scale for the selection of NOAA officers (pg.4).

Cross-validated correlation coefficients ranging from .50 to .65 lead to the recommendation that the SVIB be integrated into the present procedures for selecting NOAA officers.

An Assessment of a New System for Annual Administration of the Family Housing Survey, Final Report. WTR 73-7. September 1972. 54 pp. DDC Availability No. AD 750 685. L. A. Broedling.

This study involved the development and evaluation of a new system for annual administration of the family housing survey.

The Naval Facilities Engineering Command is responsible for coordinating an annual survey of family housing which is used to determine military family housing requirements. The present survey system was questionnaires which must be keypunched. These questionnaires are administered by monitors at group sessions. This system is both time-consuming and costly. The new system involves use of a questionnaire which is suitable for optical scanning and the questionnaires are self-administered.

The new system was tested in conjunction with the CY 71 and CY 72 surveys at selected test locations. The results showed that the new system is feasible to use for the survey. A cost analysis showed the new system to be much more efficient than the present one. An inquiry of survey personnel indicated that, in terms of administrative efficacy, they regarded the new system to be superior.

It was recommended that the new system be made operational for all armed services using a sampling methodology to conduct this survey. Further refinements in the system were suggested.

Sources of Job Satisfaction and Dissatisfaction Among Navy Nurses. SRR 73-10. September 1972. Joyce E. Dann.

The proportion of Navy nurses who remain in the Nurse Corps after completing their obligated services has been relatively small. An increase in retention would be expected if Navy nursing could be made more rewarding by identifying and removing causes of dissatisfaction.

The present study sought to determine sources of job satisfaction and dissatisfaction among Navy nurses and to identify areas where constructive changes in the Nurse Corps might be made.

Questionnaires were mailed to all Navy nurses on active duty to determine the most and least attractive aspects of Navy nursing and to solicit suggestions for change. Nine hundred ninety-five nurses replied.

Responses of these nurses were categorized to determine the most frequently mentioned satisfiers, dissatisfiers, and recommended changes. Results were summarized for the total sample and for the following subgroups of nurses: first tour female nurses, female career nurses, male nurses, anonymous respondents, satisfied nurses, and dissatisfied nurses.

Aspects considered most attractive by nurses in the total sample included interpersonal relations, travel, achievement, the work itself, and security and fringe benefits. Aspects considered least attractive were hospital policy and administration, Nurse Corps policy and administration, non-nursing duties, and supervision. Suggestions for change were most often in the areas of Nurse Corps policy and administration, hospital policy and administration, job duties, supervision, and achievement opportunities. Based on these results, it is recommended that the aspects of Navy nursing considered most attractive be emphasized in recruiting and that changes recommended be evaluated for possible implementation.

Basic Statistical Report of Findings, Navy Sample Survey NSS 72-1. WSR 73-2. October 1972. 147 pp. DDC Availability N. AD 751 300.

NSS 72-1 is the first survey in the Navy Sample Survey series. The Navy Sample Surveys are conducted on a tri-annual basis to ascertain information concerning the attitudes and opinions of Navy officers and enlisted personnel. The information is gathered for use by Navy managers in the evaluation of personnel plans and programs and in the formulation of Navy policy.

During the second week of March 1972, questionnaires were mailed directly to 2,938 officers and 3.210 enlisted personnel. Responses were received from 80% of the officers and 75% of the enlisted personnel.

Topic areas included in NSS 72-1 were: information sources, duty assignments, the Navy Sponsor program, human relations, perception of personal abilities, warrant officer uniforms and background characteristics.

The Navy Adjective List as a Predictor of Enlisted Retention. SRM 73-2. October 1972. Norman M. Abrahams and Lynn A. Lacey.

The heavy loss of highly trained and experienced naval personnel who fail to reenlist continues to be a major personnel problem.

One approach to reducing the impact of turnover is to place man with the greatest likelihood of reenlistment in assignments which are most critical and for which training is most expensive. The present research evaluates the effectiveness of an experimental test, the Navy Adjective List (NAL), in identifying men with superior reenlistment likelihood. The relationship between several types of NAL scale scores and subsequent career decisions was determined for a sample of 390 men who had been tested as recruits.

Empirical keys developed from NAL responses had limited value in predicting retention. However, rational scales measuring anxiety, achievement, and social desirability were moderately effective individually and in combination.

The results of this study suggest the adjective check list approach to have some value in predicting tenure. It is planned to refine and expand the scales measuring the psychological dimensions found most effective. Experimental administration to a sample of enlisted personnel near the end of their first enlistment will permit evaluation of the new scales.

Design and Fleet Trial of Automated Performance Evaluation Forms for Two Pay Grade Groups: E5-E6 and E1-E4. SRR 73-11. November 1972. David W. Robertson, Marjorie H. Royle and Jim James.

The traditional method of acquiring on-job performance evaluation marks for enlisted personnel is deficient in two respects: (1) the scales do not adequately differentiate among actual levels of rates performance, and (2) the manual forms and procedures do not permit timely processing and application of the data for important individual personnel actions. New formats and scales tailored to two specific Pay Grade groups, 5-6 and 1-4, were developed to deal with these deficiencies. Although automated processing equipment was used, the primary thrust of the project was on substantive, rather than hardware, considerations.

Alternative marking scales and coding procedures for each pay grade group were experimentally administered to a fleet sample. Two alternative Optical Character Reader (OCR) forms, a mark-sense and a character-sense mode, were used to test the automated capability.

All experimental forms provided distributions of marks substantially more discriminating than the present operational form, especially for the Pay Grade 5-6 group. Of special concern was the inflationary and stultifying effect of the present coding procedure, even on the new forms. Preparation time, discrepancy rate, and processing time were much higher for OCR than OMR type documents. Specific recommendations are provided for substantially improving both the source document design and the system design.

PRINCE - Personnel Reactions to Incentives Naval Conditions and Experiences: A Longitudinal Research Study, Measurement of Attitude Change During Recruit Training. WTR 73-11. January 1973. 60 pp. DDC Availability No. AD 756 632. J. Schneider and A. Katz.

This report is the third in a series of reports from a longitudinal study of enlisted men's reactions to incentives, naval conditions and experiences. Data were collected from 6,795 men in AFQT Categories I, II and III at the beginning of and at end of recruit training.

The report contains data analyses relating to: (a) perceptions of recruit training, (b) the importance of 21 work and non-work related factors; (c) perceptions of attainment opportunity for these factors, that is, whether they are more attainable in the Navy or civilian life; (d) relationships between perceptions and attitude change with reenlistment and career intentions; and (e) a graphic mapping of a sample of enlistees based on reenlistment intention responses.

The data indicated that perceptions and attitudes changed during recruit training and that concurrent relationships between intentions and perceptions were statistically significant. The data did not support the causal linkages between perceptions and intentions.

Mapping intention responses indicated that at least 50%

of the enlistees who intended to reenlist or who intended to leave the Navy at entry to recruit training maintained that intention during the recruit training period. Seventy-one percent who were undecided at entry were undecided at the end of recruit training.

It was concluded that future research must better conceptualize the variables which determine retention behavior and that the causal linkages among the variables be better specified and empirically validated.

Survey of Navy Drug Usage. WTR 73-12. January 1973. 62 pp. DDC Availability No. AD 908 180L. A. J. Gelfman and A. C. F. Gilbert.

The objectives of this study were to determine the scope of nontherapeutic drug use in the Navy and the demographic correlates of this drug use.

Approximately 19 percent of the Navy sample reported the use of one or more non-therapeutic drugs. The respondents were divided into four drug groups and one non-drug group on the basis of their reported current drug involvement. The results showed that the greatest potential risk for drug use is that individual who is 19 or younger, single, in pay grade E-3 or below, and not a high school graduate. The drug user usually started with marijuana. He does not believe that he has a drug problem; however, he would prefer civilian to military treatment if a problem arose. He also does not know his supervisor's attitude toward drugs. The frequency of drug usage was related to the possibility of drug use while on duty.

Occupational Analysis: Report of Analysis of Job Satisfaction Data for Aerographer's Mate Rating. WTR 73-13. February 1973. 73 pp. DDC Availability No. AD 757 018. L. A. Goldman.

This investigation comprises a study of the extent of satisfaction/dissatisfaction for 710 billet incumbents of the Aerographer's Mate (AG) rating, based on 33 job factors and two overall measures of satisfaction. These 33 job factors include 20 factors inherent in the job itself and 13 factors external to the job. The overall measures are present job satisfaction and overall military career satisfaction. Differences, if any, based on military paygrade, reenlistment intention sex, and mental ability for these billet incumbents are studied.

The following is noted for this rating: (a) men are as equally satisfied as women; (b) individuals with differing mental ability levels essentially are equally satisfied; (c) there are significant differences between military paygrades, with E-8/E-9 personnel being the most satisfied and E-5 personnel being the least satisfied; (c) personnel who do not plan to reenlist are more dissatisfied than those whe do plan to reenlist with two exceptions: Training for the job and Guidance and terms of reference.

In terms of all AG's, those job factors which are relatively more dissatisfying are ascertained.

Recommendations are made to improve upon the analysis of job satisfaction in other Navy ratings.

The Validation of the Strong Vocational Interest Blank for Predicting Naval Academy Disenrollment and Military Aptitude. STB 73-3. February 1973. Norman M. Abrahams and Idell Neumann.

Despite rigorous selection procedures, approximately one-third of the officer candidates admitted to the Naval Academy disenroll before being commissioned. The present research sought to examine the usefulness of the Strong Vocational Interest Blank (SVIB) for improving the selection of Naval Academy midshipmen.

SVIBs have been administered since 1967 to applicants and/or entering Naval Academy midshipmen and analyzed to determine their value in predicting disenrollment and military aptitude. Three separate interest scales were empirically developed to predict motivational disenrollment, academic disenrollment, and military aptitude. The scales were evaluated for both their individual predictive effectiveness and, where possible, for their contribution to existing selection procedures.

All three scales yielded significant and useful relationships with their respective criteria in cross-validation samples.

The empirically-developed scales also provided significant and useful cross-validated increments beyond the levels of predictive accuracy attained with the present composite.

It is recommended that the selection procedures for the Naval Academy be modified to take advantage of the unique contribution afforded by the SVIB.

An Evaluation of a Vocational Interest Test in Recruiting Officers. SRR 73-16. March 1973. Patricia J. Thomas and CDR Don G. Hinsvark, USNR-R.

In 1970 an exploratory study was conducted with the Strong Vocational Interest Blank (SVIB) as a tool for recruiting officer candidates in high schools. Of the 460 students tested, the 96 who scored high on the Navy officer keys for the SVIB were contacted and encouraged to apply to the Navy Academy. Their motivation toward a Navy career was rated on a seven point scale by the officer who interviewed them.

Followup interviews were conducted in 1971 with 91 of the original 96 interviewees to determine what their career plans were and and what their reaction had been to this recruiting method. Their motivation toward achieving a commission was again rated and the SVIB scores of those who applied to an officer program were identified for comparison with those who had not.

Thirteen students had applied for an NROTC scholarship or to the Naval Academy. Of the nine Academy applicants, only four had stated this intention during the first interview. The SVIB key previously developed to discriminate between Academy graduates and disenrollees was the best of the four Navy keys for officer recruiting purposes. Unfortunately, four of the five students who could not be reinterviewed were minority members so the evaluation of the SVIB as a recruiting instrument useful with non-whites could not be accomplished.

Since over half of the Naval Academy candidates had not considered applying prior to seeing their interest profiles, the use of the SVIB to identify and encourage potential officers is thus an effective means of officer recruiting. It is therefore recommended that this method be applied on a nationwide basis.

A Multivariate Comparison of Drug Users and Non-Users. WTR 73-22. April 1973. 44 pp. DDC Availability No. AD 759 024. A.C.F. Gilbert, and J. F. Mazzuchi.

The purpose of this study was to determine the pattern of drug types reported by enlisted personnel applying for amnesty under the Navy's Drug Exemption Program as well as to attempt to differentiate on the basis of certain demographic and cognitive variables between a random sample of individuals receiving drug related discharges and those receiving honorable discharges during the three year perior prior to the implementation of the Exemption Program.

More than 86 percent of the Exemption applicants reported using a combination of drug types; about 30 percent reported Opiate use, and about 5 percent were drug dependent. Drug users were younger, held lower pay grades, and had a lower educational level than those not reporting illicit drug use. The results of the discriminant analysis yielded a significant difference between the two groups on five of the cognitive variables but the resulting classification scheme left much to be desired in that one third of the time it favored misclassification of those who received drug related discharges and those who received favorable discharges.

Preliminary Validation of an Interest Inventory for Selection of Navy Recruiters. SRM 73-3. April 1973. Norman M. Abrahams, Idell Neumann and Bernard Rimland.

The quality and quantity of the enlisted manpower of the Navy is in large part dependent upon the effectiveness of Navy recruiters. The advent of the all-volunteer armed forces has made selection of the most capable recruiters increasingly important.

Since the Strong Vocational Interest Blank (SVIB) has been used successfully by the Naval Personnel and Training Research Laboratory (NPTRL) to predict officer retention as well as the successful completion of Naval Academy and NROTC programs, the use of the SVIB for the improvement of recruiter selection was investigated.

The SVIB responses of the most and least effective recruiters at 36 main recruiting stations were contrasted for half the sample to select a set of valid items. These items comprised the Recruiter Interest Scale-1 (RIS-1). When cross-validated on the remaining sample, the RIS-1 scale discriminated quite well between the most and least effective recruiters. It is therefore recommended that the RIS-1 scale be used to identify potentially effective recruiters. Suggestions were proposed to increase the number of applicants for recruiting duty and to further improve recruiter selection.

A Primal-Dual Method for Minimization with Linear Constraints. STB 73-4. April 1973. DDC Accession Number AD 758 635. Gordon B. Hatfield.

The purpose of this report is to develop a general algorithm for solving the class of nonlinear programming problems that have linear constraints. The constraints can be either equations or inequalities and the variables can be free or non-negative. The objective function is assumed to be continuously differentiable. The algorithm is an "effective" second-order method in that slow convergence is eliminated without requiring second partial derivatives. In addition it combines the desirable features of projection methods, conjugate gradient methods, and methods that solve LP problems to obtain feasible directions. Computational results on a wide vareity of test problems are given. Some comments on the efficiency of the algorithm as compared to other algorithm is included.

Attitudinal Changes in Category IV Perceptions of the Navy During Recruit Training. WTR 73-17. May 1973. 83 pp. M. Goldsamt.

Attitudinal shifts during recruit training of 1,837 Category IV personnel were measured in the areas of: (a) expectations of adjustment difficulty compared to actual experiences, (b) importance of 21 environmental characteristics/personal needs, (c) preferences for the Navy over civilian life in containing these latter factors. A directional index of cohort naval preference (termed NIP), based on the probability model of attitude change, served as an interpretative aid as did four moderator variables. Analyses also were conducted for upper and lower Category IV men.

Findings indicated that Category IV men substantially overestimated the actual difficulty of adjusting to physical training, marching, classwork and following orders. Job-related and interpersonally related motivating factors were judged most important on both measurement occasions. Having sufficient off-duty time, obtaining technical training, and obtaining fast promotions to more important jobs increased in importance during recruit training. Consistent yet slight shifts in perceived importance occurred in 20 of 21 factors. The importance of interpersonal relations factors shifted most of four item clusters. Category IV preferences for the Navy setting in satisfying interpersonal relations needs declined most (NIP=20.8), primarily due to attitudinal shifts of upper Category IV men, whites and men disliking Navy life or uncertain of their attitude.

Following recruit training, the Navy is much less characterized as a setting containing: fair treatment; good supervisors; chances to discuss problems with those above them; chances to work with good people; requirements for maintaining good conduct/appearance standards; chances to engage in sports events or physical training, chances to do "a man's job" or the kind of work liked best. Study moderator variables clarified these attitudinal shifts in some instances.

Conclusions were that: (1) the industrial/organizational research literature is applicable to Category IV issues, especially where individual differences are considered; (2) moderator variables and directional attitudinal change indices were useful as interpretative aids. It was recommended that: (1) Review be made of current operational policies/procedures relevant to Category IV perceptions of difficulties with recruit training, importance of interpersonal relations needs and perceived negative characterizations of the Navy setting; (2) Future Category IV research utilize a conceptual model incorporating individual cultural organizational factors, their interaction and stability over time.

PRINCE - Personnel Reactions to Incentives Naval Conditions and Experiences: A Longitudinal Research Study, Report No. 4: The Grass is Greener: A Comparison of the Navy Work Environment with a Major Alternative. WTR 73-28. May 1973. 46 pp. J. Schneider.

This report is the fourth in a series of reports from a longitudinal study of first term enlisted personnel. This report does not contain longitudinal data. Its purpose was: (a) to provide developmental research for the inclusion of a theoretical/methodological approach for further data collection in the project, and more specifically, (b) to provide construct validation for instrumentality theory, a network of propositions of motivation which is based on decision making among alternative courses of action.

The report contains the results of data analyses about: (a) the attraction of the Navy to a sample of 128 Navy enlistees, (b) the attraction of a major alternative (being a working civilian) for the same group of enlistees, (c) reenlistment and career intentions, and (d) certainty of career intentions and satisfaction.

It was found that the attraction of the Navy was correlated significantly with reenlistement and career intentions. However, for the sample as a whole, the attraction of the alternative, being a working civilian, was higher than the attraction of the Navy. Further, the correlations between intentions and attraction were higher when the attraction of the Navy and the alternative were considered simultaneously.

It was concluded that reenlistement and career intentions/behavior research should consider perceptions and evaluations of both an individual's current work environment and potential alternative work environments. Instrumentality theory provides a theoretical basis for the collection of such data.

Attitudes of Naval Personnel Toward Policy Changes Initiated Through Z-Grams. WTR 73-45. June 1973. D. B. Greenberger and G. L. Wilcove.

This report dealt with perceptions of naval personnel to the recent policy changes. Specifically, it was asked: (a) what areas of policy change enter most into a general opinion of Z-Grams, and (b) whether areas of selected factors relate to the formation of a particular opinion toward either policy changes or their effects on Navy life.

Results are based on responses of 1,725 officers and 2,640 enlisted men, i.e., those respondents to the NPS 71-1 survey having identification numbers and who could be re-contacted. Information gathered from them included: opinions of these policy changes, their effects on Navy life and background information.

A number of item response differences existed among men of varying officer-enlisted status, years of active service, race, sea-shore duty assignment and perceived extent of supervisor's support of Z-Grams. Generally more favorable attitudes were found for enlisted men, those with the least active service non-whites, those assigned to shore duty, and those whose supervisors supported all of the policy changes. The effect of each of these factors was found to be generally independent of the other factors for each specific question.

The formation of firm conclusions about these findings is difficult due to many biasing factors, including the large amount of non-response in the sample, the generality of item phrasing, and the lack of complete support for hypotheses. However, for certain questions, the direction of responses of naval personnel, at least partially, may be predicted.

Gulka: 1130 Computer Program. STB 73-5. June 1973. Samuel E. Bowser.

This report is concerned with a discussion and presentation of a program and method for a maximum likelihood ratio test of equality of sample regression lines in the bivariate case. The area of racial comparison studies and prediction of performance were the underlying motivation for programming this technique for the computer. The method described offers a useful tool in the analysis procedures available to the behavioral scientist. The areas which are most applicable to this type of analysis are becoming increasingly important to the military personnel researcher.

Lateral Entry Recruitment at Advanced Paygrades. WTR 73-29. June 1973. 330 pp. L. H. Kernodle, Jr.

The objective of this research was to develop new methods and procedures for the lateral entry recruitment, or direct procurement, of petty officer personnel into the Navy.

These two technical questions were examined in this development: (1) Comparison of schools curricula - specific Navy ratings Class "A" Schools and comparative civilian vocational/technical schools and/or junior colleges, plus appropriate apprenticeship training; and (2) Comparison of civilian training and experience and Navy advancement qualificiations standards.

Comparisons were made for civilian occupations and training that are comparable to that for these ten Navy Career Reenlistment Objective (CREO) ratings: Air Controlman (AC), Aerographer's Mate (AG), Aviation Electrician's Mate (AE), Commissaryman (CS), Dental Technician (DT), Disbursing Clerk (DK), Electrician's Mate (EM), Engineman (EN), Instrumentman (IM), and Machinery Repairman (MR).

It was recommended to issue the personnel and training data for the Navy ratings and comparative civilian occupational specialties contained in the report to recruiters for their use in the later entry recruitment of petty officers.

A Method for Correcting the Bias Due to Non-Response in a Mail Survey. WTR 73-44. June 1973. 36 pp. R. Tsai.

This paper describes a plan for correcting or reducing the bias resulting from nonresponse to a mail survey, without actually conducting interviews. The plan requires two consecutive mailings to a random sample of individuals. The basic concept underlying this approach is that each person has a probability of responding to any given questionnaire. Under certain conditions, a consistent estimate of the population mean of a given attitude can be derived from three estimates:

(a) The conditional expectation of an individual's probability of responding can be calculated from the actual responding (or not responding) to the first and second questionnaires .

(b) The regression between the attitude score and the probability of responding can be estimated by using the respondent's observed attitude score and the number of times he responded to the two questionnaires.

(c) The mean and variance of the probability of responding of the whole population can also be estimated from the response rate to the first and second questionnaires.

Multivariate Comparisons of Category IV Recruit Training Completers and Non-Completers. WTR 73-42. June 1973. M. R. Goldsamt.

This research evaluated the optimal usefulness of biographic, attitudinal and aptitude test measures for: (a) predicting recruit training completion status among AFQT Category IV recruits, and (b) distinguishing Category IV Non-Completers from Category I-III Non-Completers. Stepwise multiple discriminant function analytic techniques primarily were used with initial findings being cross-validated.

Of 65 initial measures, 24 "best" variables correctly classified 73.3% of Category IV recruits. These measures correctly classified 95.3% of Category IV Completers and 19.5% of Category IV Non-Completers. Upon cross-validation, 15 variables were retained as those which effectively classified individuals. Four predictors were most related to classification accuracy, i.e., the Liking for People and Activities scale, perceived importance of obtaining sufficient off duty time, AFQT and BTB Radio Code Aptitude subtest.

In the second personnel classification study, 28 "best" variables yielded an overall classification accuracy rate of 74.3%. Upon cross-validation, 70.6% overall classification accuracy was obtained by using 12 variables.

Although biographic, attitudinal and aptitude scores are related to classification acuracy, results are not substantially greater than actual experience. As such, replacement and/or supplement of current recruit training screening procedures with a biographic inventory and test score profile instrument does not seem warranted at this time.

Need Satisfaction Among Junior Enlisted and Junior Officer Personnel: Use of an Existence, Relatedness, and Growth Conceptual System. WSR 73-3. June 1973. G. L. Wilcove.

The study was conducted to identify the fundamental needs of junior enlisted and officer personnel, to determine whether these needs are being satisfied by the Navy, and, based on this latter analysis, to reveal which aspects of Navy life still need to be improved.

The study utilized a conceptual system to classify aspects of Navy life related to existence, growth, and relatedness satisfaction. Questionnaire data were collected in the field from 630 first and second enlistees. The officer part of the study was composed of 180 first obligors who completed the questionnaire in group sessions and 301 first obligors who were mailed the questionnaire.

Both enlisted and officer personnel noticed a variety of improvements during the last year. Enlisted men noticed appreciable improvement in aspects of their lives related to the Need to Belong and the Need for Socially Reception Superiors. Officers noticed appreciable improvement in fringe benefits which help satisfy the Existence need and appreciable improvements in satisfying their need to belong. Both enlisted and officer personnel noticed appreciable improvement in particular aspects of other need areas. Neither enlisted or officer personnel perceive these improvements as being directly associated with the "Z-Gram" policies. Various recommendations are offered for determining the direction of future policy actions based on current levels of satisfaction.

Occupant Opinion of Navy Family Housing: A Study of the Livability, and Attractiveness of Navy Family Dwellings, Environments, and Services.

WTR 73-38. June 1973. B. Farr.

This report presents the major findings from a survey which assessed the opinions of the occupants of Navy family housing. The study had a dual purpose: (1) to inform those who manage and maintain Navy housing about the prevailing climate of opinion and the satisfaction level of current occupants; and, (2) to furnish guidelines to be used as the basis for incorporating modifications into future housing design plans.

A questionnaire, consisting of 123 structured and 3 write-in questions, was distributed to 16,744 officers and enlisted men occupying Wherry, Capehart and Fund-After 1960-Housing at 15 selected locations. The total number of usable returns was 9,447, representing a return rate of 56%.

The report contains: (a) a review of literature which provides an overview of the scope and thrust of previous research pertaining to occupant satisfaction and environmental influences on behavior; (b) answers to factual questions (i.e. style and age of dwelling, floor space, number of bedrooms, dimensions of storage space, etc.) which were provided by housing officials; (c) responses of residents to demographic questions; (d) opinions relating to design features and alternative floor plans; (e) opinions of the adequacy of maintenance and services provided by Navy housing; (f) a summary of the write-in responses; (g) a discussion of the findings; and (h) an analysis of some of the fundamental issues underlying housing design along with tentative recommendations relating to the direction of future policy and research.

Taken as a whole, the findings indicate that there is: (1) a reasonably high degree of overall satisfaction with living quarters, their setting as well as the services and facilities, and (2) a fairly low level of satisfaction with the overall appearance of neighborhoods.

However, the responses to the write-in questions suggest that there are major areas of unresolved dissatisfaction which stem from a variety of causes.

Response Errors to Factual Survey Questions and Accuracy of Information in the Navy's Automated Personnel Records. WTR 73-46. June 1973.
L. A. Broedling and E. S. Mohr.

Two types of errors present in mail surveys of naval personnel were studied in this investigation. One was the errors in the responses given to survey items on factual characteristics (e.g., pay grade, marital status, etc.). The other was the errors present in information in the Navy's automated personnel records which are used for survey sample selection and data analysis.

Response errors were assessed by obtaining two sets of responses to the factual survey items from the same group of people and also by comparing questionnaire responses to information in the personnel jackets. Errors in the automated records were assessed by comparing their information to the personnel jacket information.

The results showed a wide variance across items in the average amount of response error. Items inquiring about present and/or stable characteristics had high consistency of response, while items pertaining to past characteristics or ones subject to change generally had substantially lower consistency. Tests of statistical significance showed no differences in response consistency on the basis of sex or time interval between questionnaires but showed non-Caucasians to be less consistent than Caucasians and enlisted personnel to be less consistent than officers. More inaccurate information and more missing data was found in the automated records than in either the personnel jackets or questionnaire responses.

The Role of Women in the Navy: A Study of Attitudes and Scale Development.

WTR 73-41. June 1973. C. H. Fuller.

Data from two surveys were analyzed in an investigation of attitudes toward the role of women in the Navy, reports of discrimination, and evaluation of questionnaire items used to measure attitudes toward Navy women. It was found that, while white and black women perceived themselves to be discriminated against relative to white men, both black and white women reported less discrimination than was reported by black men. Discrimination appeared to have the greatest effect upon career plans for white enlisted men. Women tended to report more favorable opinions regarding women's abilities than did men. Opinions of women's abilities were found to be related to attitudes toward expanding the role of Navy women. On the basis of the results of item analyses, the questionnaire items were re-grouped into consistent subsets. It was recommended that attempts to induce naval personnel to regard favorably the expanded role proposed for Navy women should be focused first on perceptions of women's ability to perform the new duties. The questionnaire items should be validated against an independent behavioral criterion.

Stratified Versus Random Sampling Scheme for Surveys of Naval Personnel.

WTR 73-43. June 1973. 26 pp. R. Tsai.

This research was initiated to determine the best way to stratify the population proportionately for particular attitudes of groups of attitudes. The goal was to construct the best stratification scheme possible.

The Navy keeps biographical information on all active duty naval personnel on master file tapes. This research attempts to fully utilize the information contained in the master file for the purpose of stratified sampling. Forty attitudinal questions were chosen from the NSS 72-1 questionnaire. For each of the 40 attitudinal questions, the optimal biographical items for the stratification of the population was determined.

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TRAINING AND EDUCATION

Training and Proficiency of Aviation Electrician's Mates. PRASD Report No. 213, July 1963. (Later issued as PRD Technical Bulletin 63-9.) Lloyd S. Standlee and Eugene A. Hooprich.

A survey was made of 132 Aviation Electrician's Mates (AE) who had recently graduated from AE Class "A" school and were assigned for duty in 31 squadrons in the San Diego area. The data were gathered by means of a service record search, interviews, a paper-and-pencil test, supervisory and self ratings, and a job diary.

There was some agreement among AE's that more emphasis was needed in AE Class "A" school on the use of maintenance publications and test equipment and on the maintenance of compass systems. Also, a number of Naval Air Maintenance Training Detachment and Fleet Airborne Electronic Training Unit instructors thought that more emphasis should be placed on electronics, circuit systems, transistors, AC theory, and amplifiers. In general, though, "A" school graduates appear to be doing a creditable job of electrical maintenance in their first duty assignment, and no major change in the formal instruction of AE's was recommended.

The Replacement Air Group (RAG) training program, on the other hand, may merit some serious reconsideration; many of the present samples were assigned directly to permanent duty squadrons rather than to RAG squadrons for further training, and the requirements of maintaining aircraft for pilot training appear to preclude giving on-the-job training to many of those AE Class "A" school graduates who are assigned to RAG squadrons for training.

Methodology for Conducting Systematic Training Feedback Studies in the Area of New Weapons Systems. Report No. ND 64-14, Personnel Research Memorandum, August 1963. (W)

Describes a proposed methodological approach for the conduct of training feedback studies in the area of New Developments on a continuing and systematic basis.

Programmed Instruction in Basic Electricity. PRASD Report No. 219, August 1963. (Later issued as PRD Technical Bulletin 63-10.) Lloyd Standlee, Eugene Hooprich, and John LaGaipa.

Students in eight classes of the Basic Sonarman (Surface) Course were taught basic electricity under the experimental conditions of programmed vs. conventional method of instruction, high vs lower qualified instructors, and easy (DC) vs difficult (AC) subject matter.

No one method of instruction, ability level of instructors, or difficulty level of subject matter was found consistently to yield superior student achievement. Nor were there consistent interaction effects. Overall, though, there was a tendency for students to achieve slightly more under the programmed method of instruction.

Students' attitudes were more favorable toward the programmed method of instruction when the subject matter was relatively easy (DC) than when the subject matter was difficult (AC). Instructors' attitudes toward programmed instruction tended to be negative. Students and instructors agreed, however, that the programmed materials were relatively easy to read.

Though the programmed method of instruction tended to be slightly superior in terms of objective tests of student achievement, both students and instructors thought that the programmed materials should be used to supplement rather than to replace conventional methods of instruction.

Experimental Training of Sonarmen in the Use of Electronic Test Equipment: V. Performance Result on a Diagnostic Trouble Shooting Test. PRASD Report No. 222, October 1963. (Later issued as PRD Technical Bulletin 63-15.) Alvin J. Abrams and Edward J. Pickering.

This report describes the effectiveness with which 84 sonarmen performed on an elementary diagnostic trouble shooting test. All members of the sample were fleet input sonarmen from two advanced maintenance courses at the Fleet ASW School, San Diego.

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The results indicate both strengths and weaknesses in the sonarmen's trouble shooting performance, with special attention to the use of test equipment. It was recommended that school administrators review these results in considering future course modifications.

The Implications of the Developing Navy Maintenance Management System (and some predecessors) for Facilitating Weapons (and other) Systems Training Research. The Clifton Corporation, December 1963. (W)

This report is a review of the Standard Navy Maintenance Management System and an analysis of the implications for training research in this system. It includes recommendations for research projects in the area of preventive maintenance, corrective maintenance, and training effectiveness feedback.

Comparison of Army Manpower Control Officer Course with Naval Organizational Analysis Course. PRASD Report No. 228, January 1964. Harry T. Bailey, LTJG, USN.

This report presents a comparison between the Army's Manpower Control Officer Course at Fort Benjamin Harrison and Navy's PN-C1 school at San Diego. This report is a by-product of a larger research project concerned with development of a method for conducting shipboard manpower utilization surveys.

Survey of NROTC Practices in Manuevering Board Instruction. PRASD Memorandum Report 64-2, February 1964. Thomas E. Curran and Edward A. Rundquist.

Informal discussion with maneuvering board instructors suggests that students find considerable difficulty in learning this skill in a classroom situation; it also brings out a wide variety of opinions on methods of instruction. Disagreement appears especially marked on which ship to use as reference ship.

As a first step in a research program for investigating methods and techniques for maneuvering board instruction, a questionnaire designed to elicit information concerned with time allotments, reference ship, and special procedures found helpful was sent to all 53 U. S. Naval Reserve Officer Training Corps units. Fifty units replied to the questionnaire of which 47 were sufficiently complete and served as the basis for this report.

Results, which are reported for informational purposes only, indicate: (1) a surprisingly wide range in time allotted to maneuvering board instruction, (2) a marked preponderance of instruction permitting the use of either ship as reference ship, (3) that 80% of the NROTC units no longer use torpedo problems in their curriculum and about 25% no longer use scouting problems, and (4) that a wide variety of techniques are used in its instruction.

The variety of the findings adds to the evidence for more research in this area. One NROTC approach, including the entire series of problems used, is included in the report.

Proposals for Maintenance Training Research. PRAW Report No. 64-17, March 1964.

This report reviews recommendations contained in Clifton Corporation report on the "Implications of Maintenance Management System for Training Research," December 1963. It contains recommendations for weapons systems training research project considered appropriate for inclusion in the PRAW training system research program.

Rotational Shipboard Training Program for Surface Missile Systems. PRASD Memorandum Report No. 64-6, March 1964. James A. Saxon.

The purpose of this study was to determine the feasibility of cross-training personnel within a weapon system, to evaluate the cross-training presently being accomplished, and to determine the effects (if any) of cross-training on operational efficiency. Interviews were conducted or questionnaires administered in all TERRIER, TARTAR, and TALOS ships operational in the fleet. A total return of 81% of officers and system chiefs, and 83% of Fire Control Technicians (FTM) was obtained. It was found that although cross-training was considered worthwhile, methods of implementation of cross-training were not clearly defined, operational requirements hampered implementations, and adequate materials and aids were not available. The development, validation, and use of self-training devices, followed by rotational assignments among subsystems, was recommended.

Tryout of an Experimental Course in Programmed Instruction Techniques. PRASD Report No. 232, April 1964. Eugenia N. Kemp and William A. King.

An experimental workshop in programmed instruction was conducted to find out whether naval personnel could be taught to produce usable programs in an actual Navy subject matter area during a two-week training period. The results of the study were positive. This suggests that the Navy can reasonably expect to overcome one of the greatest barriers to its use of programmed instruction--the lack of programs for specific Navy courses--by developing an "in-house" capability for program development.

Programmed Instruction Document for Use at Guided Missile School, Dam Neck, Virginia. NAVPERS 92900 Systematic Trouble Shooting, May 1964. (W)

This document was prepared for use at the U. S. Naval Guided Missiles School, Dam Neck. The document was prepared in programmed instruction format utilizing linear and branching techniques as appropriate for the various sections.

Programmed Instruction Documents for Use at Guided Missiles School, Dam Neck, Virginia. (W)

NAVPERS 92901 Boolean Algebra	1 June 1964, 267 pp.
NAVPERS 92902 Mechanics of Motion	1 June 1964, 191 pp.
NAVPERS 92903 Transistors	1 June 1964, 398 pp.
NAVPERS 92904 Inertial Navigation	1 June 1964, 213 pp.

These documents were prepared for use at the U. S. Naval Guided Missiles School, Dam Neck. The documents were prepared in programmed instruction format utilizing linear and branching techniques as appropriate for the various sections.

Training Feedback Information Requirements and Methods in the Research, Development, Test and Evaluation of Navy Systems. Report No. 65-4, Personnel Research Memorandum, July 1964. (W)

This is a study of the training feedback process in the research, development, test, and evaluation of Navy systems. The Report makes recommendations which provide a basis for the development and implementation of a training feedback information system for use in the evaluation of training programs and curricula.

An Analysis of Naval Officer Educational Background. PRL Report No. RS 64-50, Washington, D. C., August 1964. M. E. Johnson and J. M. Pugh.

An analysis of college undergraduate programs completed by naval officers to determine extent and scope of subjects which are common to all undergraduate curricula, and to determine adequacy of the curricula in preparing officers for technical duties.

The Effect of Irrelevant Information on Decision Making in Simple Games with Simple Strategies. STB 65-8, March 1965. William H. Payne.

The purpose of this study was to determine the effect of irrelevant information on decision making in a simple 5x5 two-person zero-sum game. Irrelevant information was furnished by multiplying each value in the payoff matrix by a constant. Four constants were used. Eight college students served as subjects for this experiment. The subjects played in pairs, each making 200 decisions on each side of every game. This type of irrelevant information had no influence on the subjects' decisions.

Effect of Practice on Decision Making in Simple Games with Simple Strategies. STB 65-7, March 1965. William H. Payne.

A preliminary experiment to evaluate the effectiveness of practice on the ability of personnel to make decisions in simple 5x5 zero-sum two-person gaming situations was conducted with college students as subjects.

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Four decision problems were used in the experiment. The S's played against each other in pairs; each S attempted to maximize accumulation of points.

It was found that the S's were able to learn through practice alone to approximate minimax solutions to the problems. With this simple situation no significant transfer from problem to problem was found; thus, there was no indication that learning on one problem had any marked effect on learning another problem. Large differences between problems were found, indicating the presumably obvious fact that the subjects' ability to make correct decisions depends on the difficulty of the decision problem.

An Evaluative Survey of Electronics Training in Military and Civilian Organizations. STB 65-11, March 1965. John H. Steinemann.

The present investigation was designed to obtain detailed information regarding the state of electronics training technology, and to provide a comparison of the current training practices of a variety of military and civilian organizations.

An extensive review of relevant training literature was followed by an evaluative survey conducted during 1964 by correspondence and personal visits with selected training agencies throughout the United States. Five types of organizations were included in the survey: (1) military, (2) academic, (3) industrial, (4) technical institutes, and (5) home study institutes.

The survey revealed many similarities in basic electronics instruction among the various agencies; evident differences in approach or methodology often reflected fundamental differences in training goals.

Certain training practices and devices which appear particularly effective, on the basis of survey information, are noted and described in detail. These include the utilization of closed-circuit television, classroom systems which permit immediate feedback of trainee responses to instructors, some programmed instruction applications, and versatile student electronic trainers for laboratory activities.

Specific recommendations are also made for facilitating Navy electronics programs, including suggested adoption of some training methods and materials which were found in non-Navy programs. Final evaluation of the relative value of any specific training recommendations, however, will depend upon their demonstrable contribution toward specified training objectives in operational Navy situations.

An Experimental Comparison of Instructional Techniques for use in Teaching Computer Program Flow Chart Design. STB 65-10, March 1965. John K. Meyer.

Four small groups of college students, selected to approximate groups having difficulty in the Navy basic course in computer programming, were taught flow charting for computer programming purposes by two methods and two lengths of practice. The only significant differences found concerned the influences of aptitude as measured by the mathematics tests from the Navy Officer Classification Battery and by programmer aptitude tests. It is tentatively concluded that selection is a more important problem in training programmers than methods of training. It is recommended and planned to collect further information to confirm or deny this conclusion.

Objective methods were developed for grading the final examination flow chart exercise. Plans include developing and simplifying this grading procedure for use with other designs.

Experimental Evaluation of Programmed Materials on the Multimeter AN/PSM-4. STB 65-9, March 1965. Alvin J. Abrams.

This report describes the development and evaluation of a programmed text and a "programmed instructor" presentation on the Multimeter AN/PSM-4, a commonly used piece of electronic test equipment. The programmed materials were developed at the Navy Training Research Laboratory.

Eighty-one students at the Fleet ASW School, San Diego, were used in the evaluation of the two programmed methods. The students were divided into three groups: 31 were trained with the programmed text, 16 were trained with the "programmed instructor" presentation and 35 were trained by the conventional method. Performance of the groups was observed on a practical test one week after training.

The results revealed that: (1) Students who were trained with either of the programmed methods performed better than those students who were trained by the conventional method. (2) Students learned to use the Multimeter AN/PSM-4 in its elementary applications with the programmed text as the basic source of information. (3) It was feasible to use the programmed text to introduce beginning technicians to the multimeter. (4) It was not feasible to use the "programmed instructor" presentation.

Training Understanding of Relative Motion. I. An Experimental Evaluation of Spatial Reference Systems Used in the Solution of Naval Manuevering Problems. STB 65-4, March 1965. Daniel N. Braunstein, Eugene A. Hooprich, and E. A. Rundquist.

An initial experiment in a program of research on training in the understanding of problems of relative motion at sea is described. Instruction was modeled after that currently in use and emphasized practice in solving problems presented in written form. A comparison was made between possible systems of spatial reference: own ship in the center and guide ship in the center.

Solving change-of-station problems using the guide ship system was faster for higher aptitude college students but for lower aptitude students there was no difference. A training method which alternated the reference systems from problem to problem proved poorer for lower aptitude students. Error criteria tended to confirm the superiority of the guide in center system but differences were not highly reliable. Two operations used in obtaining problem solutions were found to be responsible for these results. General performance did not indicate any substantial understanding of the principles of relative motion problem solution in any of the groups, although a marked increase occurred in scores on the relative motion subtest of the Officer Classification Battery given four months later as part of a retention study. Results of the retention study confirmed original conclusions made concerning spatial reference systems. No conclusions affecting instructional practice should be drawn until the completion of the presently planned series of studies.

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Training Understanding of Relative Motion: Analysis of Errors Made in Solving Naval Maneuvering Problems. STB 65-6, March 1965. Eugene A. Hooprich and Daniel N. Braunstein.

As part of a series of studies concerning training in the solution of naval maneuvering problems, an analysis was made of errors committed by college students while solving change-of-station problems. One approach was a detailed classification of errors made on a final examination; another consisted of five short tests of the separate problem solution steps.

Plotting, especially in the context of actual problems, was the major source of errors. There also were a large number of errors related to the use of the logarithmic time, speed, and distance scale. Measuring errors were relatively infrequent.

The plotting errors consisted primarily of errors in plotting maneuvering positions, especially the ordered position (M_2), and of drawing the relative motion vector in the wrong direction. The errors in plotting the ordered position (M_2) apparently were due to confusion occurring when the conversion of bearing was required.

The conversion of bearings and the use of the logarithmic time, speed, and distance scale are two operations that might well be improved by separate practice. However, the major source of errors, plotting, apparently could more likely be improved by training in an actual problem context rather than by simple drill on the mechanics of plotting.

Although the data are not completely consistent, there is an indication that the use of the guide as the reference ship for solving change-of-station problems is less prone to several types of errors than is the use of own ship.

An Exploratory Investigation of the Effects of Ambiguity in Training Materials on Sonar Cue Judgments. STB 65-13, April 1965. Alfred G. Klipple.

In this exploratory study, an initial test was made of the hypothesis that subjects who in training are repeatedly required to judge highly ambiguous sonar pip shapes will have less accuracy in judging unambiguous pip shapes than will subjects who are not required to attempt these difficult discriminations. Twenty-eight male college students were used as subjects. Fourteen of these subjects were trained on ambiguous materials and fourteen were trained on unambiguous materials.

The results indicate that the subjects trained on ambiguous materials were less accurate in judging unambiguous pip shapes than the subjects who were trained on unambiguous materials. There was no difference between these subjects in their judgments of ambiguous pip shapes. It is recommended that a more comprehensive study be conducted which would take into consideration additional sonar cues and the effects of varying training time.

An Exploratory Investigation of the Value of Tachistoscopic and Reading Pacer Exercises for Improving Reading Skills. STB 65-14, April 1965. Eugene A. Hooprich.

An exploratory study was conducted to try out reading program materials, to obtain tentative answers to certain research questions, and to develop hypotheses for further reading-training research. Twenty-five male college students were divided into three experimental groups and a control group. The training of one experimental group consisted of tachistoscopic, reading pacer, and reading booklet exercises; another group received reading pacer and booklet exercises; the other did only reading booklet exercises.

The major findings, subject to certain qualifications, are as follows: (1) The training techniques used in the experiment to produce some improvement in speed of reading popular magazine type materials, with little loss in comprehension. (2) the reading speed gains do transfer to the reading of more technical materials. (3) The tachistoscopic exercises used in this experiment apparently do not contribute much to the improvement of reading skills. (4) Mechanical devices, such as tachistoscopes and reading pacers, although providing a convenient means of programming training, may not be necessary for the improvement of reading skills.

A program of further reading experiments is outlined.

A Further Evaluation of a Programmed Text on the Use of the Multimeter. STB 65-12, April 1965. Alvin J. Abrams.

A programmed text on the AN/PSM-4 Multimeter was developed for use in Navy electronics courses. It was tried out with classes from the Basic Sonarman Course at the Fleet Anti-Submarine Warfare School, San Diego. Results of that study revealed that students trained with the program performed better than students who were given the usual lecture-demonstration training; but it was also noted that the desired level of performance was not achieved, and that students became fatigued while working on the program. In an attempt to correct these deficiencies the present study was undertaken.

This report describes the effects of adding practical materials to the programmed text and of presenting the text under two training conditions. Twenty-eight male college students were used as subjects; 14 were given 10 hours of instruction during a period of two days, and 14 were given 10 hours of instruction over a period of four days.

The results reveal that: (1) There was a higher level of performance than was noted in the previous study, but mastery was not yet attained. (2) Students trained under both conditions performed similarly. (3) Students trained under the four day conditions reported greater satisfaction.

Progress Report on the Polaris University Extension Program. PRL Report No. ND 65-42, Washington, D.C., April 1965. W. B. Cooper.

Reviews the history; operation; value to the Navy; current status and enrollment statistics for the past fourteen months of the Polaris University Extension Program.

A Comparison of the Effects of Two Mach Meters on Officer Performance on the Air Battle Analyzer. SRR 65-6, June 1965. Everett A. Loughridge & Wm. H. Payne.

This study is the first in a series aimed at improving the training of AAW evaluation in performing threat evaluation and weapon assignment functions. Its purpose was to improve the Johns Hopkins Air Battle Analyzer (ABA) as a device for classroom simulation of air battles. Four supplements to the ABA were developed: a rectangular plotting sheet which permits a threat from any bearing, a range-altitude template which does not rely on a printed paper scale, a simple mach meter, and a separate protractor for use in determining bearings. This study compared the ABA and the newly developed mach meter. The latter was found to be superior in terms of both time and errors.

Suitability of a Simple Task for the Study of Team Training Problems. SRM 65-5, June 1965. William H. Payne and Daniel N. Braunstein.

This study was an exploration of the suitability of a simple signal detection task (locating 7's intermingled with Z's) for studying some organizational problems encountered in team training. The three team organizing conditions were sequential, parallel, and individual. Four teams of subjects were used. Stimulus materials were rigidly controlled, and order of conditions was counterbalanced. No significant differences were found in number of signals detected. It was concluded that the task was too simple for team training studies.

Preparation for Problem Solving: Structural vs Strategy Pretraining. STB 66-1, July 1965. DDC Availability Number, AD-619 705. Edward A. Rundquist, John D. Ford, David J. Chesler, William D. Rohwer, Jr., and Harriet M. Braunstein.

In an attempt to answer questions regarding performance improvement in complex applied problems, an experiment was designed to examine the effects of pretraining on the efficiency of concept attainment. Two principal varieties of pretraining were provided to groups of college students whose subsequent performance on five criterion tasks was compared with that of *Ss* who received no pretraining. The *Ss* were taught either to analyze problem materials into their structural components or to apply a strategy for the solution of concept attainment problems. In either case, the training was relatively extensive, consuming ten one-hour sessions for each *S*. The criterion battery comprised three typical laboratory concept attainment tasks of more than twenty problems each, one concept identification task and a fifth task that required the attainment of sequential or temporal concepts. The dependent measures of principal interest revealed slight, reliable, but insubstantial increments in the performance of *Ss* given strategy pretraining but not for those given structure pretraining. The most powerful effect of strategy training was to increase dramatically the tendency of *Ss* to withhold hypotheses until sufficient information has been acquired to insure accuracy. The discrepancy between these results and those reported previously is considered and the utility of laboratory concept attainment tasks for applied research is questioned.

Training, Utilization, and Proficiency of Navy Fire Control Technicians. STB 66-2, July 1965. DDC Availability Number AD-621 679. Chester R. Bilinski.

To determine the effectiveness with which FT's operate and maintain their equipment, a survey of the training, proficiency, and utilization of a five percent sample of Navy FT's assigned to Pacific Fleet and western continental United States commands was conducted from September 1963 to July 1964. All rates from Seaman to Master Chief were represented in the approximately random sample of 164 FT's. Results of the administration of a check list, performance and knowledge tests, rating scales, and work diaries are presented.

FT's appear to be adequately trained to operate equipment, but maintenance training, including training in the use of test equipment and troubleshooting appears to need improvement. Detailed information presented in the appendices should prove valuable to curriculum designers and instructors. Evidence obtained suggests that the utilization of technical FT skills should be critically reviewed.

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Training Understanding of Relative Motion: III. Geographic Model and Traditional Instruction. STB 66-3, August 1965. DDC Availability Number AD-621 172. Thomas E. **Curran** and Daniel N. Braunstein.

This is one of a series of studies aimed at improving Navy instruction in solving maneuvering problems.

Two groups of college students were initially trained in relative motion problem solution through demonstration and application of the relationship between motion on geographic and relative plots (conceptual model method). Two other groups of subjects received traditional formula-bound instruction (geographic model). Aptitude and plotting orientation (own ship vs guide ship as reference) were also evaluated.

No differences were found between the groups in accuracy of solutions achieved on drills involving change of station maneuvering problems administered immediately after initial training. Nine months later, however, those trained by the conceptual model method did better in making inferences concerning the relative motion of two ships from plots of actual geographic positions. Conceptual model training increased the solution speed of students who had high relative motion aptitude and decreased the speed of low aptitude students in comparison to their conventionally trained counterparts. No differences were found attributable to plotting orientation. The next step in this research program will be concerned with improving the conceptual model training method.

Training Understanding of Relative Motion: IV. Status and Implications of Current Research. STB 66-5, August 1965. DDC Availability Number AD-621 173. Daniel N. Braunstein.

Results of three experiments in training for solution of maneuvering board problems are reviewed. It is concluded that: (a) training in understanding of relative motion is difficult under methods of classroom instruction thus far used; (b) traditional, formula-bound training was inadequate when transfer of training criteria, involving basic understanding of relative motion, were used; and (c) a method, emphasizing conceptual model building, inferences, and approximate solutions, shows some promise but needs more development and evaluation. Some needed research is suggested.

Information Use and Task Solution Efficiency in Two Types of Concept Attainment Tasks. STB 66-9, September 1965. DDC Availability Number AD-623 083. John D. Ford, Jr., and Harriet M. Braunstein.

This report describes one in a series of studies designed to determine how training programs should be devised to take into account individual differences in solving complex cognitive tasks.

An experiment was conducted which replicated an earlier study done by Westcott (1961), in which he obtained behaviors which he described as intuitive problem solving. The experimenters were interested in reassessing his tentative finding of certain personality items as correlates of that behavior, in determining the relationships of two newly formulated cognitive measures to that behavior, and in testing the generality of these behavioral measures by relating them to similar measures obtained from a concept attainment task. Briefly, the problem solving task allowed Ss to obtain various amounts of information in order to reach a solution. Eighteen male and 18 female Ss completed an 18-item problem solving task, a three-problem concept attainment task, tests of abilities to evaluate problem solutions and to generate problem solutions, and several personality inventories (including those items reported by Westcott). Responses to the problem solving and concept attainment tasks were scored for correctness of solutions and amount of information used to reach solutions.

The results support the performance findings of Westcott but fail to support his conclusions of certain personality patterns as correlates of task performance. In contrast, it was suggested that correctness of solution on problem solving may be a function of the ability of Ss to evaluate possible solutions. Indications were also found that if an S has a tendency to think of unusual solutions, his performance may be determined by the amount of information he seeks before responding. There were no personality or cognitive correlates across the problem solving and concept formation tasks, but the tasks are related in terms of the information demand dimension. It is suggested that investigation of the cognitive correlates of problem solving may prove fruitful.

Navy Leadership Courses, Films and Publications. September 1965. E. P. Somer.

This report provides relevant findings on the opinions of officers and enlisted men concerning their need for, and experience with Navy Leadership courses (both formal, and station or type command), films, and publications. The sample consisted of 16,126 enlisted men and 3,786 male officers.

Six percent of the total sample reported having taken at least one Class C leadership course. More than half of the surveyed officers reported they had taken at least one of the leadership courses. Three in four of the enlisted men and six in ten officers who had completed leadership courses rated them as "Good" or "Very Good." Opinions of the length of the leadership courses, instruction, usable material was rated favorably by a majority of the officers and men. The majority of both enlisted men and officers expressed a need for more leadership training, this need being particularly stressed by career-motivated officers and men. Fewer than half of the enlisted men and seven in ten officers reported having seen at least one in a list of five Navy leadership films. Generally, both officers and enlisted men in the higher pay grades rated the films most favorably. Four in ten enlisted men and approximately five out of six officers reported reading one or more of three Navy Leadership publications; more officers indicated easy access to the publications than enlisted men. Officers and men in the higher pay grades indicated a higher incidence of reading them than did those in the lower pay grades.

Accuracy and Consistency in Judging Active Sonar Classification Cues: I. Overview of Problem and Summary of Findings. STB 66-12, November 1965. DDC Availability Number AD-474 957. Alvin J. Abrams and Alfred G. Klipple.

This report presents a review of the literature pertinent to problems in judging and interpreting sonar cues and summarizes an exploratory study. The exploratory study investigated the accuracy and consistency of judgments of twelve cues used or proposed for sonar classification systems. Subjects were 14 male college students. The rationale for interpreting the accuracy and consistency data is discussed in detail, as are problems of sampling cue conditions, defining cue response categories, and establishing criteria for evaluating cue perceptibility.

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Results of the study are presented in detail in three other reports, each of which is concerned with one mode (audio, STB 66-14; video, STB 66-17; graphic, STB 66-22). In general, with respect to training, the results are interpreted to suggest: (a) the need for better definition of the response categories of many cues, and (b) the need for research on new techniques for audio cue training. It is anticipated that information gained from this type of study will be of value both in cue training and in evaluating the contribution of individual cues to classification systems.

An Investigation of the Utility of a Conversion Chart as a Job Aid for Electronics Technicians. STB 66-13, November 1965. DDC Availability Number AD-624 608. Eugene A. Hooprich and John H. Steinemann.

As a part of continuing research to increase the effectiveness of Navy training, an experiment was conducted to determine if a wallet-sized conversion chart would be a practical and convenient job aid for electronics technicians in training and on the job. Three groups of Navy personnel were used as subjects: 42 experienced technicians, 30 experimental ET School trainees, and 30 personnel with little or no electronics training. The criterion used to evaluate the effectiveness of the job aid was a measurement conversion test composed of ten completion items. One-half of each experimental group was allowed to use the conversion chart while taking the test, and the other half was not permitted to use any aid. The major finding was that those trainees using the conversion chart did significantly better on the test than those trainees not using it, and they also did as well as experienced technicians using or not using the chart. Questionnaire responses indicated that the subjects considered the conversion chart to be better than other similar aids and to be of value in the job or training situation after only brief instruction and practice. Distribution of the chart to Navy technical personnel is recommended, and proposed formats for the front and back of the card are presented.

Accuracy and Consistency in Judging Active Sonar Classification Cues: II. Audio Cue Judgments. STB 66-14, December 1965. DDC Availability Number AD-476 221. Alfred G. Klipple and Alvin J. Abrams.

This report presents data on the accuracy and consistency of judgments of four auditory sonar cues: echo onset, Doppler, echo length and echo strength. Performance on the echo onset is described in greater detail, since this cue was of primary interest. Subjects were 14 male college students.

It was found that Doppler was judged correctly over half of the time; accuracy on other cues fell below this 50 percent level. The accuracy of echo onset, judgments varied both in terms of the onset category (fast, mixed, slow) and of the Doppler type (up, down, no) which were physically present. Similarly, judgments of Doppler were influenced by the rate of onset of the echo.

Because judgments on most cues were more frequently wrong than right, the value of the echo onset, echo length and echo strength cues is questioned. Findings are interpreted to suggest that training emphasis on items of slight Doppler might have produced more accurate Doppler performance. Recommendations are that: (1) criteria be developed which indicate how accurate and consistent judgments of audio cues must be in order that each cue add to the accuracy of the overall classification decision, (2) studies be directed toward other possible training methods, and (3) studies be conducted to determine the relative effectiveness of different sets of response categories for audio cues.

Accuracy and Consistency in Judging Active Sonar Classification Cues: III. Video Cue Judgments. STB 66-17, December 1965. DDC Availability Number, AD-476 605. Alvin J. Abrams and Alfred G. Klipple.

This report describes the video cue phase of the overall active sonar cue study; judgments of the pip shape, target angle, pip elongation, and pip consistency cues studied. Performance on the pip shape cue is described in greater detail, since this cue is of primary interest. Fourteen male college students served as subjects.

In general, it was found that the accuracy and the consistency with which these video cues were judged was fairly high. This was especially true of the pip shape and pip elongation cues. It is recommended that criteria be established for determining the levels of accuracy which are required to justify the utilization of each video cue in various classification systems, and that an illustrated guide be prepared which defines and describes precisely the response categories for each video cue.

Comparison of Conventional and Programmed Instruction in Teaching Avionics Fundamentals. STB 66-16, December 1965. DDC Availability Number AD-627 162. Alexander A. Longo and G. Douglas Mayo.

This study is one of a series of investigations involving a variety of course content and training conditions where programmed instruction will be compared with conventional classroom instruction to provide information about the general utility of programmed instruction.

Here the performance of 200 trainees taking 26 hours of conventional instruction in electrical calculations, direct current circuits, and direct current meters is compared with the performance of 200 trainees taking 19 hours of programmed instruction on the same content.

Results indicate: (1) the basic electronic students learned a relatively large block of programmed material to about the same degree but in substantially less time than was required by conventional instruction; (2) the constructed response examination, prepared for programmed instruction purposes, exhibited satisfactory reliability; (3) the conventional and programmed instruction groups did not differ significantly with respect to variability in performance; and (4) the "90/90 performance level" of programmed material decreased as a function of the amount of programmed material tested at a given time.

Accuracy and Consistency in Judging Active Sonar Classification Cues: IV. Graphic Cues. STB 66-22, January 1966. DDC Availability Number AD-478 395. Alfred G. Klipple and Alvin J. Abrams.

This report presents data on the accuracy and consistency of judgments of four graphic cues which are displayed by the Tactical Range Recorder. These cues are trace length, trace consistency, trace strength, and differential edge alignment. Performance on trace length cue is described in greater detail, since this cue was of primary interest. Fourteen male college students served as subjects.

In general, it was found that the accuracy and the consistency with which the trace length cue was judged was fairly high; however, accuracy of judgments of trace strength, trace consistency and differential edge alignment was rather low. It is recommended that efforts be made to: (1) establish criteria for determining the levels of accuracy that are required to justify the utilization of each graphic cue in various classification systems, (2) develop and evaluate training methods which are oriented toward problems encountered in judging graphic cues, (3) evaluate the relative effectiveness of other response categories for graphic cues.

Instructor Duties as a Factor in Instructor Requirements. PRL Report No. WRM 66-22, Washington, D. C., January 1966. J. H. Swann, M. E. Johnson and H. M. Worth. DDC No. AD 476 504.

Research results on the first phase of the problem concerned with developing a procedure for computing the number of instructors required for fleet schools are contained in this memorandum. The results of an inventory and comparison of instructor duties at selected fleet, functional, and service schools which is the primary concern of this memorandum, indicate that the similarity of the amount of time instructors spend on student contact and other duties points up the feasibility of developing one type of instrument that will predict instructor requirements at the three types of activities, although factors may be weighted differently for each activity. It is recommended that the next step in this research be concerned with constructing the instrument for computing the number of instructors required for the schools.

A Procedural Guide to Operational Sequence Analysis in Personnel Research.

SRM 66-19, January 1966. David A. Wilson. DDC Availability Number AD-477 767.

This report is intended to provide investigators and planners who construct and use Operational Sequence Diagrams (OSD) with useful background information, resource material, and procedural guidance.

The OSD has proved to be an effective tool of analysis in the development of Navy man-machine systems. However, the many different approaches, formats, and styles which have emerged have caused both analysts and those who use their product some difficulty in understanding and utilizing OSDs. Further, it appears that operational sequence analysis has not yet been fully exploited in the field of personnel research.

Certain standardization of analytic procedure, format and symbology is suggested in the interest of enhancing the utility of the product. It is not intended, however, that such standardization limit the further development of operational sequence analysis as a personnel research procedure.

The guidance in this report should aid Navy personnel planners in satisfying documentation requirements of cognizant divisions in each stage of system development. Reference to this guide should aid each user of OSDs to fully exploit the value of their content.

Proficiency of Basic Sonar Maintenance Trainees in the Use of Common Test Equipment.

SRR 66-14, January 1966. Joseph Branks. DDC Availability Number AD 627 987.

In order to determine the proficiency of Basic Sonar Maintenance trainees in the use of common test equipment, fifty-eight students in the Basic Surface Sonarman Course at the Fleet Anti-Submarine Warfare (ASW) School, San Diego, were tested during July of 1965 on their use of basic electronic test equipment. All were tested at the completion of the ten-week maintenance phase of the course. Two diagnostic tests were administered which were designed to identify the specific procedural errors accounting for inaccurate measurements.

One test was a replication of a test given to students at the ASW School on three other occasions; its readministration allowed a comparison of the current students to the groups tested previously. The other test was designed to meet the current needs of the ASW School; it provided more detailed diagnostic information.

The results indicated that the current students performed better than the previous groups. This improvement is attributed to course changes which emphasize the practical use of test equipment. In addition, a number of common procedural errors in the use of test equipment were identified; these errors are discussed in detail in the body of the report.

It is recommended that the information contained in this report be considered by School administrators in making course revisions and that the diagnostic test developed for this study be used by the School on a continuing basis.

Training, Utilization, and Proficiency of Data Systems Technicians. STB 66-19, January 1966. Chester R. Bilinski and Lloyd S. Standlee. DDC Availability Number AD-627 375.

To determine the effectiveness of the performance of Data System Technicians (DS), a survey was made of 114 Data Systems Technicians (DS's) who were assigned to activities and ships in the western United States and Pacific. Most of the DS's had converted from other ratings. The data were gathered by means of record searches, written and performance tests, rating scales and work check lists and diaries.

The DS's were found to be working on a wide variety of tasks within their rating but at any one particular task only infrequently. Some areas of weakness were found in mathematics, in electronics fundamentals and in the use of test equipment. In general, though, the DS's were performing their maintenance duties at a relatively high level of proficiency.

Doppler Discrimination as a Function of Variations in Dimensions of the Sonar Echo. STB 66-25, February 1966. Alan W. Lau. DDC Availability Number AD-480 130.

The purposes of the study were to: (1) Identify the effects that variations in echo length, echo onset, and relative signal strength have upon the ability to discriminate Doppler correctly; (2) evaluate the effect that training has upon the improvement of Doppler discrimination; (3) examine whether or not transfer of training occurs when subjects are tested on sea-recorded materials. Subjects were drilled and tested on their ability to judge Doppler. The training and test materials consisted of synthetic echoes superimposed upon a sea-recorded reverberation pattern. The echoes were systematically varied with respect to type of Doppler, echo length, echo onset and relative signal strength.

Effectiveness of Programmed Instructional Materials Designed to Integrate Lower-Level Supporting Behaviors into Higher-Level Behaviors in a Learning Program for Computer Flow Chart Design. STB 66-24, February 1966. John D. Ford, Jr., and John K. Meyer. DDC Availability Number AD-630 981.

This study sought to evaluate a preliminary version of a learning program designed to teach computer flow charting. A method suggested by Gagné was applied to the task of designing computer flow charts. In this method analysis began by identifying the supporting behaviors needed to perform the criterion task. The behavior needed to perform the supporting behaviors was then identified, and so on. It proved impossible to obtain a complete hierarchical structure for the flow charting task. Instructional materials were developed for virtually all of the learning sets. These materials comprised the basic or control program. In the experimental program integrative instructional materials were added to the control program. Each trainee spent 15 hours on a program. Trainee flow charts were rated on three skills: (1) Symbolic representation, (2) configural design, and (3) conceptual formulation. Trainees taking the experimental program received no higher ratings than those taking the control program. Mathematics aptitude had a strong effect on achievement as measured by the skill ratings. Moderate support for a hierarchical task structure is found for the skill area of symbolic representation, although the results are by no means conclusive. The remaining two areas seem to conform much less to a hierarchical organization. In addition to the data obtained by ratings, observation of trainees while they worked on flow chart design problems uncovered procedural or process behaviors which characterized the more successful trainees. This evidence plus the extreme difficulty in reducing flow charting to a completely hierarchical structure causes us to believe that effective learning programs for this task will consist of materials developed from several models of learning. Some parts of the program may use the hierarchical concept of learning, other parts will very likely be organized on quite different models of learning.

Course Design Manual for Job Training Courses (A Preliminary Edition). SRR 66-17, March 1966. Navy Training Research Laboratory in cooperation with Commander, Training Command, U. S. Pacific Fleet. DDC Availability Number AD-630 604.

This report is a preliminary edition of a manual designed to assist instructors in developing and improving job-related training courses. The course design process is explicated in nine operational steps. Suggestions are developed for accomplishing each step. Material from actual course design is used to illustrate the steps.

An Experimental Evaluation of Methods for Improving the Reading Skills of Students at a NESEP Preparatory School. SRR 66-16, March 1966. Eugene A. Hooprich and Edward H. Anderson. DDC Availability Number, AD-630 601.

An evaluation was made of the relative effectiveness of several reading training methods differing in number or type of reading devices and time of training. Comparisons were made among five matched groups (four training groups and a control group) each composed of 12 NESEP Preparatory School summer students. Pre- and post-training test performance comparisons showed significant increases in speed of comprehension for three of the four training groups. There were no significant differences in amount of speed of comprehension gain among the four training groups, which differed with respect to use of machines or schedule of training. None of the experimental groups made significant gains in level of comprehension. A change in post-training test orientation, emphasizing speed, significantly increased reading speed and decreased reading comprehension test performance.

Pitch Memory for Near Threshold Stimulus Differences. STB 66-28, April 1966. E. G. Aiken and A. W. Lau. DDC Availability Number, AD-482 390.

The increasing range of active sonar contacts raises questions concerning the ability of the operator to detect very small amounts of Doppler, when the reverberation and echo are separated in time. To get some data relevant to this problem, an investigation of memory for the pitch of a short duration pure tone pulse was conducted. Utilizing an 800 cps standard stimulus with comparison stimulus separations of 0, ±3, ±4, ±5 cps, discriminability and constant error measures were taken with .95, 4.5, and 8.9 sec inter-stimulus separations. The data justify the following conclusions: (1) Pitch discrimination shows no reliable change over the inter-stimulus interval from .95 to 8.9 sec; (2) the nature of the incorrect responses indicates an increasing willingness to report a pitch difference as the interstimulus interval increases; (3) a bias in reporting more "lower" than "higher" pitch differences at the .95 sec interval reverses at 4.5 sec and is absent at 8.9 sec; and (4) the data are consistent with much previous research involving pure tone discrimination, and with most of the data on Doppler discrimination employing sonar stimulus materials.

It is inferred that no decline in near threshold Doppler judgments is likely up to about a 9 sec separation between reverberation and echo. However, specific training aginst high and low Doppler response biases at certain time separations is indicated.

Air-Ocean Environment Course, Class "C" Training Feedback Study and Implications for Aerographer's Mates (AG) Rating. PRL Report No. WRM 66-41, Washington, D.C., May 1966. DDC Number AD 483 203L. J. A. Nobile and N. R. Skoog.

The purpose of this memorandum was to provide the training command with operational feedback information useful for improving the Air-Ocean Environment Course Class "C" at NATTC, Lakehurst, N. J. This specialized training is given to Aerographer's Mates (AG) who will be performing duties in ASWEPS. In addition, this memorandum presents preliminary plans for integrating the AOE Course into existing AG (A) and AG(B) Schools. Advantages and disadvantages for training all AG's in ASWEPS are also presented for consideration by personnel responsible in planning future personnel and training policies for Aerographer's Mates.

Evaluation of a Technique for Classroom Practice in Decision Making. SRR 66-18, May 1966. DDC Availability Number, AD-635 597. Norman M. Abrahams.

A study was conducted to evaluate, in terms of students' interest and instructional effectiveness, individually administered notebook exercises in anti-air warfare decision making. One group of student officers received the notebook exercises and conventional instruction while another served as the control group for comparison purposes and had only the conventional instruction. Both groups took a criterion test after all instruction was completed. From the criterion test, it was tentatively concluded that the exercises improved decision quality. Additional data from a questionnaire clearly indicated that students find such an approach interesting and helpful.

A Training Feedback Study of the Fire Control Technician Class "B" School. PRL Report No. WRM 66-37, Washington, D. C., May 1966. G. E. Mierke. DDC No. AD 481 649L.

The purpose of this study was to investigate the adequacy of the curriculum of the Fire Control Technician's Class "B" School. Information was gathered by the use of student and instructor questionnaires and through discussions with supervisors and the Director of the school.

The overall effectiveness of the curriculum was judged to be adequate, but time allotted for certain problem areas was found to be inadequate.

It is recommended that an additional one to three weeks be added to the course in order to provide sufficient time for proper coverage of the curriculum.

Automation of Operational Sequence Analysis and the Development of Materials for Shipboard Training of Navy Operator/Technicians. SRM 66-41, June 1966. David A. Wilson.

The Operational Sequence Diagram (OSD) technique was previously shown to be an effective tool for the conduct of personnel and training requirements research on developmental weapon and support system (see SRM 66-19). This study undertook to determine the feasibility: (a) of utilizing automatic data processing methods and equipment to construct and/or revise OSDs; and (b) of utilizing OSDs as direct source documents for the development of materials for shipboard training and proficiency of Navy personnel.

It was determined that it is feasible to utilize computers for the construction of functional analysis OSDs and for the analysis of OSD-derived mathematical system models. It is also feasible to store both functional and task analysis OSD information on tape or cards to facilitate frequent and economical revision and updating of the OSDs. Finally, the feasibility of developing shipboard training and proficiency evaluation materials from task analysis OSDs was established.

Computerized Training Input Plan for Nuclear Powerplant Operators. SRR 66-22, June 1966. Richard D. Conner and R. L. Colvin, PNC, USN.

This report describes a computerized program designed to assist enlisted training planners in determining long range recruit input requirements necessary to fill quotas to the Nuclear Powerplant Operator "C" School. The program develops training input plans for twenty-two future quarters. Basically, it operates by moving enlisted personnel from recruit input status through recruit training, through "A" school, through a period of fleet experience, and eventually into the Nuclear Powerplant Operator "C" School. During the first few quarters of the planning process, the program accounts for individuals who are already ordered to the school (ASO), programmed school input (PSI), and already in recruit training.

The Nuclear Powerplant Operator Training Input program has been developed to relieve training planners of a large computational workload and to allow a timely responsiveness in requests for changes to the plan. This program will also be used as a tool to aid in evaluating the effects of various policy decision alternatives relative to training input plans. Future use of the program in other areas is discussed in the report.

Procedures for Determining Number of Instructors for Navy Enlisted Schools. PRL Interim Report, Unnumbered, Washington, D. C., June 1966. J. H. Swann and M. E. Johnson.

Procedures contained in this report were established to predict and/or determine the number of instructor requirements for Navy, Fleet, Functional, and Class A, B and C Schools.

Presented are research results on the second phase of the problem concerned with developing procedures for computing the number of instructors required for Navy enlisted schools. Results are presented in the form of: (1) an "Instructor Duty Inventory" (Appendix B) for use in establishing the workload of instructors as a basis for computing instructor requirements; and (2) a proposed revision of BuPers Instruction 1510.97 to promulgate and provide additional instructions in regard to the procedures. It is recommended that the operational feasibility of the procedures be tested on a trial basis at Navy enlisted schools before final recommendation for publication.

Status Report on the Polaris University Extension Program. PRL Report No. WRM 66-60, June 1966. W. B. Cooper. DDC No. AD 486 537L.

This report reviews the current status of the Polaris University Extension Program; evaluates its progress; appraises its value to the Navy; and is intended to publicize this education program within the Navy Department.

Comparison of Performance on Analogous Simulated and Actual Troubleshooting Tasks. SRM 67-1, July 1966. John H. Steinemann. DDC Availability Number, AD-636 994.

This investigation compared the performance of a group of subjects assessed on a simulated troubleshooting task and on the identical actual troubleshooting task using real equipment. Subjects were 14 students in the experimental training program for Electronics Technicians, conducted by the Navy Training Research Laboratory, San Diego.

Analysis of results revealed that the simulated performance measure did not provide a valid estimate of performance proficiency on the actual task. Obtained negative inter-test correlations indicate that simulated test results would actually be misleading in terms of estimating actual performance score discrepancies, there were observable differences in specific performance procedures and overall troubleshooting strategy attributable to the differences in test mode. The evidence strongly suggests caution in assuming that a simulated performance measure, even with considerable face validity, will provide a valid estimate of actual performance on a common task.

A Performance-Oriented Electronics Technician Training Program: I. Course Development and Implementation. STB 67-2, August 1966. Edward J. Pickering and Adolph V. Anderson. DDC Availability Number, AD-489 570L.

In January 1964, the Navy Training Research Laboratory (NTRL) was assigned responsibility for developing, conducting and evaluating an experimental Electronics Technician (ET) training program. The general goals of this program were: (1) to train men whose aptitudes were lower than those typically qualified for ET A School, (2) to train them in a shorter period of time, and (3) to train them so that their skills would be more immediately useful on the job.

This report discusses NTRL's orientation toward this program, reviews the research design, and presents a detailed description of the steps which were followed in developing and implementing the course. Examples are presented of various types of materials used in the course.

A brief discussion is included concerning the degree to which the general goals of the program were met. Later reports will cover in detail within-course and fleet evaluations.

Prompting vs Feedback in Training Auditory Judgments of Varying Difficulty. STB 67-5, August 1966. E. G. Aiken. DDC Availability Number, AD-639 225.

Two training procedures were compared for their efficiency in training two auditory judgments. One procedure (prompting) involved presentation of the correct answer before the presentation of the stimulus. The other procedure (feedback) involved presentation of the correct answer after the subjects had judged the stimulus. Results indicate: (1) A substantial trend toward superiority of feedback in improving pitch discrimination performance at two levels of difficulty, (2) a trend toward superiority of prompting in the training of pitch and intensity identification, (3) a substantial trend toward greater transfer to a Doppler discrimination problem following auditory identification as opposed to auditory discrimination training. Recommendations are made concerning implications of the data for Navy training and future research.

A Review of Electronics Training Research Literature. STB 67-1, August 1966. Eugene A. Hooprich and John H. Steinemann. DDC Availability Number, AD-638 681.

The Navy Training Research Laboratory, while conducting research directed toward the advancement and improvement of Navy training, has endeavored to keep abreast of current developments in training technology. The present review of electronics training literature is designed to augment and update information obtained from a previous evaluative survey of military and civilian electronics training programs. The review is based primarily on available research reports published during recent years and pertaining to the training of electronics personnel in the military services. Five major areas of electronics training research are considered in the review: troubleshooting approaches and trainers, maintenance manuals and other job aids, training course variables, experimental electronics training courses, and training evaluation. General trends in electronics training research are noted and their relationship to the findings of the previous evaluative survey is discussed.

A Two Year Follow-Up of Marines Assigned to a Special (Correctional) Training Branch during Recruit Training. SRR 67-3, September 1966. Bernard Rimland and Idell Neumann.

This report presents a follow-up evaluation of the field performance of a sample of marines who had as recruits been given Special (correctional) Training (ST) for physical or psychological deficiencies. Performance data were collected by mail for 900 men given Special Training at Parris Island during the first half of 1964. A control group of 2,000 marines trained during the same period but not given Special Training was used as a basis of comparison. Performance was measured in terms of pay grade, disciplinary offenses, conduct and proficiency ratings, and early discharge.

When initial ability was held constant by comparing the ST Group with a Control Group matched in terms of high school graduate status and verbal aptitude, part, but not all of the deficit disappeared.

While the study permitted an evaluation of the field performance of graduates of ST Training, it did not permit a determination of the effects of ST Training *per se*, because the research design did not include a control group requiring ST Training but not provided such training.

The ST marine is expensive to train because he requires a high instructor-to-recruit ratio, and because he diverts high-caliber instructors from training duty with the ordinary marine recruits. The present study showed there to be a measurable surplus of substandard or below-average marines in the ST Group; nevertheless, a substantial proportion of the ST men were found to perform at an acceptable level. Whether the outcome of ST Training may be worth the cost is beyond the scope of this investigation.

A Comparison of Prompting Versus Feedback in Verbal and Perceptual Learning. STB 67-8, October 1966. Alan W. Lau. DDC Availability Number, AD-647 459.

This report reviews the literature on two general approaches to training--feedback and prompting. These techniques are examined in four interrelated areas: (1) Verbal learning, (2) categorical perceptual identifications, (3) comparative perceptual judgments, and (4) monitoring. Following this review, suggestions for further research are made.

In general, the review shows prompting to be as effective as, and sometimes more effective than, feedback in improving performance on both verbal and perceptual learning tasks, with substantially shorter time investments. The position that a response-contingent procedure is the most effective training procedures does not, at least in some kinds of learning, appear to be tenable. Apparently, the advantage of prompting over feedback lies in the achievement of greater temporal contiguity between the stimulus and its identification and also, to some degree, in the avoidance of requiring students to make incorrect overt responses. In some learning situations, prompting has the additional advantages of directing attention more effectively toward relevant stimulus characteristics and providing more information about these characteristics.

Individual Differences in the Process of Solving Problems; Computer Flow Charting and Relative Motion Tasks. STB 67-9, November 1966. John D. Ford, Jr., and John K. Meyer. DDC Availability Number, AD-647 977.

This was an exploratory study aimed at developing methods and hypotheses about how individuals solve complex problems involved in Navy instruction. Particular attention was given to instances where individuals were required to solve problems with requirements that were inconsistent with their most highly developed skills and aptitudes, e.g., individuals with high verbal aptitude required to solve problems which were mainly mathematical in nature.

For only three of the six types of problems used in the study was it possible to observe and categorize the problem-solving activity. One purpose of this study therefore--comparison of problem-solving activity across tasks of different types--could not be achieved. Among three types of problems for which processes were observable and could be categorized, the processes for one, Concept Attainment, were sufficiently different from the other two to make clear that problem-solving strategies vary from task to task and may even be specific to a single type of task.

For two tasks, Flow Charting and Relative Motion problems, responses were categorized in a manner descriptive of the processes used in working on them. Major findings were the marked differences in approaches or strategies for solving these problems by groups differing in verbal-mathematical aptitude patterns. Different training methods will need to be developed for these groups to maximize efficiency in teaching this kind of problem solving. The time required to code and analyze responses in this kind of study require that further work in this area be deferred until a properly programmed and equipped computer is available for keeping track of trainee responses.

Multiple Versus Single Stimulus Discrimination Learning of Active Sonar Pip Shapes Under Two Training Formats. STB 67-11, November 1966. DDC Availability Number, AD-647 458. Edwin G. Aiken.

Four experimental training techniques were compared for their influence on ability to identify active sonar pip shapes. The procedures differed on whether the stimuli to be identified were presented singly or in sets of six, and whether all responses were followed by feedback or half preceded by the correct identification (prompting) and half followed by feedback. The results showed that in the prompt feedback procedure the shapes were better identified during training when they were presented singly. With 100 percent feedback, single or multiple presentation made no difference. On a criterion test, those who had received 100 percent feedback during training outperformed those who had received prompting and feedback. Other data in the training literature are drawn on to interpret these results. Information on overall levels of performance and typical shape confusions are presented and discussed.

Reverberation Characteristics in the Discrimination of Doppler. STB 67-13, November 1966. Alan W. Lau. DDC Availability Number AD-647 182.

The purposes of this study were to: (1) Examine the effect on Doppler discrimination of training personnel with materials which eliminate the initial part of the reverberation pattern and, thereby, direct the operator's attention to reverberations in the immediate vicinity of the echo, and (2) investigate whether or not Doppler discrimination is more accurate when operators attend to the contiguous portion of the reverberation which follows, rather than precedes, the sonar echo.

It was found that subjects trained on long-duration reverberations tended to perform somewhat better than subjects trained on short-duration reverberations. It was also found that operators trained to compare an echo with reverberations which followed the echo were less accurate in Doppler discrimination than operators trained to compare an echo with reverberations which preceded the echo. Performance on an achievement test given after training tended to confirm the results during training.

Training in Computer Flow Charting Using Programmed Instruction: Eliminating the Effects of Mathematics Aptitude upon Achievement. STB 67-10, November 1966. John D. Ford, Jr., and John K. Meyer. DDC Availability Number, AD-647 667.

Three studies have been conducted to discover instructional methods which would assist those who have difficulty in learning to flow chart for computer programming purposes. In all of these studies mathematics aptitude was found to be a powerful factor in influencing achievement.

During these three studies an instructional program had been constructed and successively modified without changing the relationship between mathematics aptitude and learning. Substantial revisions in the instructional program were made for the present study. These were essentially the provision of a strategy to get the students started and a means of learning the subordinate skills needed for success in computer flow charting. This program produced a higher degree of learning and virtually eliminated the differences between college students of higher and lower mathematics aptitude. The learning program can be adapted to teaching computer flow charting to those who are now failing to meet Navy programming standards. There is a cost, however. It took the low mathematics students more than 50 percent longer (13 compared to 8 hours) to complete the learning program.

A Performance-Oriented Electronics Technician Training Program: II. Initial Fleet Follow-Up Evaluation of Graduates. STB 67-15, December 1966. Nicholas H. VanMatre and John H. Steinemann. DDC Availability Number, AD-647 553.

In January 1964, the Navy Training Research Laboratory (NTRL) was assigned responsibility for developing, conducting and evaluating an experimental Electronics Technician (ET) training program. The general goals of this program were: (1) To train men whose aptitudes were lower than those typically qualified for ET A School, (2) to train them in a shorter period of time, and (3) to train them so that their skills would be more immediately useful on the job.

This report describes an evaluation of the graduates from the first two classes of the experimental ET training course after they had served six months in the fleet. Evaluation instruments included actual performance test, rating scales, interviews, proficiency rankings, and written tests.

The results of the evaluation indicated that the experimentally trained ET's were performing satisfactorily in the fleet with overall proficiency not significantly different from that of a comparison sample of concurrently trained ET A School graduates.

Procedures for Determining Number of Instructors for Navy Enlisted Schools. (Proposed NavPers), Bureau of Naval Personnel, Washington, D. C., December 1966. J. H. Swann and M. E. Johnson.

The general purpose of the procedures in this manual is to provide an objective means of determining the number of instructors required for Navy fleet, functional, and Class A, B and C schools. In addition, the procedures provide an objective means of accomplishing such purposes as: (1) predict and justify quantitative instructor requirements; (2) distinguish and justify the quantitative workload of one instructor from that of another; (3) determine the extent to which instructors are fully used; (4) keep the instructor overhead to a minimum; (5) identify areas of instructor duties which are consistent with effective instruction and operational policy; (6) furnish objective data as a basis for management decisions and actions in regard to quantitative instructor needs, and the effectiveness of training.

A Task Inventory for the Combat Information Center Watch Officer (CICWO) on a Combatant Ship under Normal Steaming Conditions for Course Design Purposes. SRR 67-9, December 1966. Thomas E. Curran. DDC Availability Number, AD-647 660.

The Navy Training Research Laboratory has proposed, in preliminary form, a procedure for designing training courses which can increase the effectiveness and efficiency of Navy training.

This report discusses the second of nine steps in the proposed procedure, "Identify the tasks to be learned," to explicate the difficulties encountered in this critical step and to show progress in overcoming them. A criterion is developed for determining the level of detail of the tasks--that each should be stated so that it can become the behavioral element of an end-of-course objective-- and the importance of this criterion for course design purposes is described. A comparison is made of tasks in the original task inventory for the CIC Watch Officer with those in a revised inventory presented in the Appendix.

Fleet Ballistic Missile Weapons System Statistics: Manning Status and Trainee Averages. PRL Report No. WRM 67-25, Washington, D. C., January 1967. L.H. Kernodle. DDC No. not required.

Summarized within this report are the following: Manning Status on board 41 SSB(N)'s and 5 Tenders (AS); Comparisons between allowances and personnel on board for instructors at Fleet Ballistic Missile Weapons System Training Activities, and statistics for students entering into training at the FBM Department, Guided Missiles School, Dam Neck, Virginia, between 1 June and 1 December 1966. Because of the nature of this study, this will not be distributed to DDC.

Skill Loss: An Assessment of Evaluation Techniques Used by Other Services and their Application to Navy Technical Ratings. PRL Report No. WRM 67-24, Washington, D. C., January 1967. A. J. Rose and T. B. Turner. DDC No. AD 649 554.

This report represents the initial phase of research in the design and development of techniques to reduce loss of technical skills due to sustained non-practice of the skills. The greatest incidence of skill loss in the Navy is presently considered to occur when personnel are assigned to non-rating related billets ashore.

This report is primarily a bibliographic survey of research previously or currently conducted by the Navy and other military services. Conclusions drawn from this survey are (1) most of this research concerns operating rather than maintenance skills and has to do with perfecting initial training methods that will prolong job skill retention, (2) specific research in progress is mainly oriented toward the long-term memory of motor skills or complex, interacting team skills on integrated systems, and (3) there is a conspicuous lack of research related to the loss of skills due to non-practice in those skills.

The report recommends that subsequent research be directed toward (1) identifying ratings and skill levels of ratings in which loss presently occurs, (2) determining the extent of skill loss encountered, and (3) determining in each instance specific courses of action designed to enhance rating skill retention.

U. S. Navy Training Research Laboratory Research in Anti-Submarine Warfare: August 1965 to December 1966. SRM 67-13, January 1967. Edward J. Pickering. DDC Availability Number, AD-810 759.

The U. S. Navy Training Research Laboratory, San Diego, is carrying out a program of research which is concerned with the training of Anti-Submarine Warfare personnel. Each year a number of reports are published which describe various phases of this research program. This publication contains non-technical summaries of all reports published between August 1965 and December 1966. It is planned that similar publications will be prepared at yearly intervals.

An Experiment in Basic Airborne Electronics Training, Part III: Effect of Reduction in Previous Training upon Ability to Learn Operational Equipment. STB 67-19, March 1967. DDC Availability Number, AD-656 893. Alexander A. Longo and G. Douglas Mayo.

This is the third in a series of reports on a longitudinal study pertaining to whether training time can be reduced in basic airborne radar technician training through judicious revision of the course. This report compares two matched groups of 29 men each on the basis of their ability to learn a representative item of operational equipment for which the Aviation Electronics Technician (Radar and Radar Navigation System) is responsible.

The results indicated that, despite the reduction of the original course from 30 weeks to 22 weeks, graduates of the revised course achieved the objectives of the operational equipment course as well as did graduates of the longer course. Based upon this information in conjunction with the information provided by the two previous reports and certain logical considerations, basic airborne radar training was reduced from 30 weeks to 25 weeks.

Fleet Ballistic Missile Systems Status: Manning Status and Trainee Averages. PRL Report No. WRM 67-43, Washington, D.C., April 1967. L. H. Kernodle. DDC No. not required.

Summarized within this report are the following: Manning Status on board 41 SSB(N)'s and 5 Tenders (AS); Comparisons between allowances and personnel on board for instructors at Fleet Ballistic Missile Weapons System Training Activities, and statistics for students entering into training at the FBM Department, Guided Missiles School, Dam Neck, Virginia, between 1 December 1966 and 1 March 1967. Because of the nature of this study, this report will not be distributed to DDC.

Trainee Source as a Predictor of Underwater Demolition Team School Performance. SRR 67-15, April 1967. William H. Githens, Idell Neumann and Norman M. Abrahams.

Information was collected on all students in UDT Classes #28 through #38 to determine if differences in graduation rate exist among Underwater Demolition Team (UDT) school trainees categorized: (1) as to source of UDT school input, and (2) on the basis of other variables.

For the enlisted sample, two variables were found to be related to UDT school success to a statistically significant degree: (1) source, and (2) age. Enlisted men from Shore or Air billets or directly from Boot Camp have a higher graduation rate than those from Fleet or Overseas Shore billets. Enlisted men between the age of 19 and 24 or who are 29 or older have a higher graduation rate than other groups.

The following variables were either of uncertain relevance or unrelated to UDT school graduation rate: (1) input source of officers, (2) age of officers, (3) percentage of officers in the starting class, (4) class size, and (5) time trend of convening classes.

Analysis showed that for enlisted men, combining age and source results in prediction better than that possible with either used alone. Still better predictive efficiency may be obtained when psychological test variables are combined with the age and Navy source variables. This will be covered in a future report.

Comparison of Conventional and Programmed Instruction in Teaching Communications Procedures. STB 67-20, May 1967. Kirk A. Johnson and Robert O. Baldwin. DDC Availability Number, AD-656 894.

This study is the third in a series of comparisons between programmed and conventional instruction within the schools of the Naval Air Technical Training Command.

In this study a comparison was made between two versions of the Airborne Radio Code Operator (ARCO) Course. In the Conventional version, Military Communication Procedures was taught by means of lecture-discussion sessions; in the Program version, this same material was taught by means of programmed booklets. The students in the Program version required a total of 14.5 hours to cover this material, as opposed to a total of 30 hours required for the lecture-discussion sessions of the Conventional version. This afforded a savings of better than 50% over this particular portion of the course, and a savings of two days in the total length of the course.

Mastery of the material was measured by means of two special tests. On the multiple choice test, the Conventional group was found to be slightly better than the Program group; on the short answer test, the Program group was found to be slightly better than the Conventional group. The difference favoring the Program group was somewhat larger than the difference favoring the Conventional group.

Boiler Water and Feedwater Test and Treatment Training Requirements for Boilerman (BT) Rating. PRL Staff Paper, Washington, D. C., June 1967. P. J. Buehler, H. W. Croulet.

This study was conducted to determine: (1) the number of personnel certified in Boiler Water and Feedwater (BW/FW) Test and Treatment required by each ship type to enable that type to maintain effective and continuous control of boiler water and feedwater chemistry; (2) the optimum relationship of BW/FW certified personnel to other members of the engineering department; (3) the probable effect of incentive pay upon the performance of BW/FW certified personnel, and upon the inclination of other members of the engineering department to volunteer for this duty; and (4) the number of automatic combustion control (A.C.C.) operators (NEC Code BT-4515) required by each ship type utilizing this equipment.

Procedures for Determining Number of Instructors for Navy Enlisted Schools. PRL Report No. WRR 67-65, Washington, D. C., June 1967. J. H. Swann. DDC No. not required.

This report presents the final results of research concerned with the development of procedures for determining the number and indicating the quality of instructors for Navy enlisted schools. The results are presented in the form of an instrument designed to be administered by schools to establish their instructor requirements.

The instrument contains procedures for establishing the man-hour workload of instructors as derived from their instructional, preparation, related, and military duties; and then calculation of the number of instructors required to perform the established man-hour workload.

The instrument appears to provide a valid, practical, and operationally feasible basis for determining instructor requirements for Navy enlisted schools. The instrument has been recommended for promulgation.

Evaluation of Supply Corps Fleet Training Materials. SRM 68-4, July 1967. Adolph V. Anderson.

The purpose of this research has been to determine the effectiveness and fleet acceptance of a set of Commissaryman Lesson Plans and a set of Military Requirements Lesson Plans for use in shipboard training programs.

Supply officers on 40 randomly selected ships representing a wide variety of ship types in the Atlantic Fleet and the Pacific Fleet were asked to review the lesson plans and complete a six-item questionnaire on the appropriateness and usefulness of the two sets of lesson plans. Lesson plans and questionnaires were mailed to selected ships in late March and returns were received through June 1967.

Completed questionnaires were received from 35 ships, 18 from the Atlantic and 17 from the Pacific. In both checked responses and write-in comments, reactions to the two sets of lesson plans were markedly favorable. The research results are very clear and lead to the recommendation that the training materials studied be duplicated and distributed to fleet units.

Initial Development and Evaluation of a Basic Electronics Assembly Test (BEAT). SRM 68-1, July 1967. John H. Steinemann. DDC Availability Number, AD-390 244.

The Basic Electronics Assembly Test (BEAT) was developed as an approach to the requirements for a measure of basic skills in the area of electronics technician performance. BEAT is a portable instrument with face validity as a measure of basic electronics skills since it involves a sampling of realistic assembly tasks and standard electronics components.

BEAT was administered as part of a pre-training inventory to five successive trainee classes of the experimental courses for Electronics Technicians (X-ET) conducted by the Navy Training Research Laboratory, San Diego, 1964-1966. Correlations were computed between BEAT scores and performance achievement in the X-ET course.

BEAT Time score was significantly correlated with achievement in the Fundamentals Phase of the X-ET course. There are indications that an instrument such as BEAT, by providing diagnostic evaluations of practical performance abilities, may prove a useful supplement to available verbal test information.

A Performance-Oriented Electronics Technician Training Program: III. Course Evaluation Instruments and Procedures. SRR 68-1, July 1967. John H. Steinemann and Eugene A. Hooprich. DDC Availability Number, AD-658 316.

This report describes the tests and testing techniques employed to fulfill the evaluation requirements of the experimental training course for Electronics Technicians conducted from January 1964 to May 1966 by the Navy Training Research Laboratory, San Diego. Analyses were made of the correlations between precourse measures and course achievement criteria, and the relationships among several aspects of course achievement. Characteristics of effective evaluative techniques, and data concerning the relative contribution of written and performance factors to course achievement are summarized.

Evaluation of an Individually Paced Course for Airborne Radio Code Operators. STB 68-3, August 1967. Kirk A. Johnson and Robert O. Baldwin. DDC Availability Number, AD-661 859.

In this study comparisons were made between an individually paced version of the Airborne Radio Code Operator (ARCO) course and two versions of the course in which the students progressed at a fixed pace. The ARCO course is a Class C School in which the student learns to send and receive military messages using the international Morse Code. The individual pacing was achieved through the use of programmed instruction booklets and audio tapes. One of the fixed pace versions was the conventional course in which the programmed booklets were not used; the other was a course in which the instructional materials were exactly the same as those used in the individually paced version.

The individually paced course required 16% less time than the conventional course and 9% less time than the fixed pace course in which the programmed booklets were used. These reductions in course length were purchased at the cost of small, unreliable losses in the final average: 1.44 and .75 points respectively. There were some indications that this evaluation might have provided a somewhat conservative estimate of the gains that can be realised through the use of individual pacing.

An Experiment in Basic Airborne Electronics Training, Part IV: Effect of Reduction in Training Time on Fleet Performance. STB 68-2, August 1967. Robert O. Baldwin, G. Douglas Mayo and Alexander A. Longo. DDC Availability Number, AD-661 858.

Three preceding reports presented the effects of shortening training time in Avionics Fundamentals and Aviation Electronics Technician R (Radar) training upon the final comprehensive examination in these courses and upon performance in a subsequent equipment course. This report compares on-the-job performance of graduates from the four groups receiving differing lengths of training.

The results indicated that shortening training time did affect supervisors' ratings of fleet performance for groups matched on the basis of grades made in a short course taken prior to training in aviation electronics.

Navy Education Survey 1967. August 1967. S. B. Ware. (W)

A survey was conducted in January/February 1967 of a world-wide representative sample of 727 officers and 1,232 enlisted men concerning the general educational level of Navy personnel and the incidence of participation in the various voluntary educational assistance programs.

Findings reveal a trend toward an increasingly higher level of education among officers and enlisted men from the time of entry into the Navy to the present.

More than one-third of both officers and enlisted men report they are currently, or have in the past, participated in one or more of the voluntary educational assistance programs.

"General educational development," "increased knowledge of my Navy job," and "increased knowledge of civilian job I hope to work in after separation from the Navy" are the three reasons most frequently given by officers and enlisted men for participating in the programs. "No interest," "lack of knowledge of program" and "lack of time" are the reasons most commonly given for not participating.

The USAFI College Level Correspondence Course and the Tuition Aid Courses are the programs with the largest incidence of participation among the officers. Among the enlisted men, the USAFI High School and College Courses have the highest incidence of participation. Almost one-half of the enlisted men indicate they intend to continue their education while in the Navy.

Both officers and enlisted men report that the Educational Services Officer is the single best source for learning about the voluntary educational programs.

Training Feedback in Electronics Maintenance. SRR 68-2, August 1967. Chester R. Bilinski, John C. Saylor and Lloyd S. Standlee.

A survey was made of fleet-to-school training feedback in electronics maintenance. The survey was conducted aboard 35 ships and 8 shore activities in the San Diego area.

At present there seems to be only sporadic feedback of electronics maintenance information from the fleet back to the schools responsible for training electronics technicians. Most existing electronics maintenance data gathering forms tend to be administrative or hardware rather than training oriented, and to be used for purposes other than improving training curricula. Fleet personnel expressed a willingness to provide training feedback data, but they also expressed a desire for minimum interference with on-the-job maintenance duties.

Fleet technicians have considerable difficulty in maintaining the MK 10 IFF system. Many of the difficulties appear to result from a lack of understanding of the overall interrelation and functions of the separate electronic equipment that make up the MK 10 IFF system, and from inability to set up and properly use the special equipment (AN/UPM-70 or AN/UPM-99) that is required for testing the system.

The structured interview technique, when based upon a thorough job analysis, appears to be a highly satisfactory way of providing fleet-to-school training feedback.

An Investigation of the Feasibility of Navy Commissaryman Training For Group IV Personnel. SRR 68-7, September 1967. Eugene A. Hooprich and John H. Steinemann.

An investigation was conducted to determine the feasibility of providing Navy Class A Commissaryman School training for Mental Group IV personnel. The achievement of 17 Group IVs was compared with that of 29 regular students in two successive eight-week classes of the Commissaryman School. Research data were obtained from service records, pretraining and course achievement tests, pre- and posttraining questionnaires, and interviews with instructors. The Group IV personnel successfully completed the Commissaryman training. However, their course achievement, as measured by typical school tests, tended to be significantly less than that of regular students in the same classes. Specific problem areas were identified, and the appropriateness of certain training modifications and job aids are discussed. Recommendations are made for the training of Group IV personnel and for further related research.

Aptitude Level and Consumer Acceptance of Programmed Instruction. SRM 68-9, October 1967. Larry G. Harding and Howard L. Fleischman. DDC Availability Number, AD-663 281.

This study was undertaken to answer the question of whether students of different aptitude levels have different attitudes toward programmed instruction. Navy and Marine students at the Aviation Mechanical Fundamentals School, Class A, were given an attitude survey covering various aspects of programmed instruction. The students were then divided into four aptitude groups on the basis of their General Classification Test or Verbal Expression Test scores.

The results indicated that all four groups had favorable reactions toward programed instruction. However, no differences in attitudes were detected between students of different aptitude levels.

A Performance-Oriented Electronics Technician Training Program: IV. Fleet Follow-Up Evaluation of Graduates of all Classes. SRR 68-10, October 1967. John H. Steinemann, Robert J. Harrigan and Nicholas H. Van Matre.

An investigation was made of the fleet utilization and job proficiency of the graduates of an experimental job-oriented training course for Electronics Technicians (X-ET). This course was designed to train lower-aptitude personnel, in a relatively shorter time, to assume ET duties in the fleet, and was conducted from January 1964 until May 1966 by the Navy Training Research Laboratory of the Naval Personnel Research Activity, San Diego.

The fleet performance capabilities of 68 X-ET's and a matching sample of 64 Class A School graduates (A-ET's) were assessed by a variety of instruments and methods. The assessment evidence indicates X-ET's were performing the duties of their rating satisfactorily in the fleet. Despite sampling differences in aptitude, length of training, and experience, which favored the A-ET group, the X-ET group demonstrated generally comparable abilities. The groups were similar with respect to the number and types of shipboard electronics gear they serviced. The majority of both groups were capable of working on equipments with only "limited" supervision, and the summary ratings for both groups on 35 specific job tasks fell within the levels indicating 75-100% successful completion of tasks without supervisory help. The overall results indicate the success of the X-ET course in qualifying lower-aptitude personnel to assume ET responsibilities in the fleet.

The Effect of Topic Distribution Within Programmed Instructional Booklets. STB 68-6, November 1967. Kirk A. Johnson. DDC Availability Number, AD-664 483.

Three experiments were done in which comparisons were made between programmed instructional booklets in which all the material on a given topic was concentrated at a single point within the program and alternative versions in which the material on a given topic was dispersed to varying degrees throughout the program. All comparisons were made between programs that had been constructed from the same set of frames.

In all except one of the nine relevant comparisons the more dispersed arrangements of topics were found to be superior to the arrangements in which all material on a topic was presented at a single location within the program though not all of these differences reached the usual levels of statistical reliability. The advantage of the more dispersed programs was greater after a delay of a week than it was on immediate tests. The more dispersed programs tended to require longer reading times.

Procedures for Determining Number of Instructors for Navy Enlisted Schools. WRR 68-6, November 1967, Washington, D. C. J. H. Swann. DDC Availability No. AD 824 246.

This report presents the final results of research concerned with the development of procedures for determining the number and indicating the quality of instructors and technical supervisors required for Navy enlisted schools. The end product of the research is presented in Appendix B to this report as BuPers Instruction 1510.105, which contains an instrument designed to be administered by schools to determine instructor and supervisor requirements.

The instrument includes procedures for establishing the man-hour workload of instructors as derived from their instructional, preparation, related, and military duties; and then calculation of the number of instructors required to perform the established man-hour workload.

Field tests of the instrument indicate that it provides a valid, practical, and operationally feasible way to determine instructor requirements for Navy enlisted schools. The instruction has been approved for promulgation.

Programmed Instruction for Selected CIC Watch Officer Tasks: I. An Experimental Evaluation of the Audio Notebook in the Teaching of Radiotelephone. SRR 68-11, November 1967. Thomas E. Curran, Navy Training Research Laboratory and John F. Brock, Fleet Anti-Air Warfare Training Center. DDC Availability Number, AD-664 235.

This research evaluates oral program instruction used with a multitape recorder, the Audio Notebook (Manufactured by Electronic Futures, Inc., North Haven, Connecticut), as a means of promoting adaptation to student differences and flexibility in instructional scheduling. Radiotelephone procedures required by the CIC watch officer position were programmed for the Audio Notebook in terms of the same learning objectives as currently stated for the watch officer course. The oral learning program took less time, much less for those with Navy experience, and achieved the objectives better than the classroom drill method. The Audio Notebook proved resistant to down-time. This makes it potentially useful for shipboard training. The learning program developed can be used in any school or shipboard situation where the learning objectives correspond to those of the watch officer course in which it was evaluated. It can be readily expanded to include additional R/T procedure objectives.

Results of Research on Aviation Entry Level Work Requirements. SRR 68-9, November 1967. DDC Availability Number, AD-663 119.

The purpose of this research was to determine the Work Requirements of entry level personnel in the aviation fields of avionics and structures/hydraulics as part of a Chief of Naval Operations program to reduce the training time of entry level personnel and, at the same time, tailor this training more closely to the work requirements that entry level personnel will be expected to fulfill at their first duty stations.

The approach involved a Navy-wide survey of aviation activities during which 3097 questionnaires were administered to entry level personnel and 436 questionnaires to their supervisors.

The conclusions reached indicated that a revised fundamentals training program, followed by a carefully tailored supplementary training program was feasible and desirable. Certain other recommendations concerning the value of current service ratings were also made.

Computer-Assisted Performance Evaluation for Team Training: General Methods and Concepts. SRR 68-12, December 1967. David J. Chesler, Navy Training Research Laboratory and Kenneth M. Scott, CDR, USN, Fleet Anti-Air Warfare Training Center, San Diego.

This report formulates a general conceptual model for computer-assisted performance evaluation in the command and control functions of naval warfare, which is applicable to shore-based training environments and to live exercises at sea, where computer capability is available for performance evaluation. This report had its origins in a computer-assisted performance evaluation developmental effort at the U. S. Fleet Anti-Air Warfare Training Center (FAAWTRA CEN), San Diego, for its Tactical Advanced Combat Direction and Electronic Warfare (TACDEW) System. TACDEW is a computerized simulation system for team training in Combat Information Center, Flag Plot, Carrier Controlled Approach, Air Intercept Control, Electronic Warfare, and Air Tactical Data System functions. Both conventional systems and Navy Tactical Data Systems are represented. Eight basic methodological steps are proposed: identification of system entities; identification of major types of operations; exercise mission; training objectives, identification of performance variables; selection of performance variables; recording and reduction of performance data; interpretation of performance data.

Diagnosis of Performance and Attrition in U. S. Naval School, Class "C" Welding Courses I, II, and III, Service School Command, San Diego. SRR 68-13, December 1967. James A. Caviness. DDC Availability Number, AD-664 991.

This research was conducted by defining factors which relate the output of Class "C" Welding School, San Diego, to the under strength level of the fleet welding force. The sample used for the descriptive statistics was 100 per cent of the enrollees matriculating during Calendar Year 1966. The areas of investigation were attenuation of enrollment, rates of attrition, policies of promotion, and loss of qualification. Salient determinants were identified, and specific areas of investigation were outlined. The data stimulated the recommendation of corrective steps, but the implementation of other corrective measures must await decisions concerning the adoption of a new course structure.

An Investigation of the Feasibility of Navy Aviation Structural Mechanic S (Structures) Training for Group IV Personnel. SRR 68-15, January 1968. Larry G. Harding, Howard L. Fleishman and Kirk A. Johnson. DDC Availability Number, AD-665 304.

The purposes of this research investigation were to determine the appropriateness of current Aviation Structural Mechanic S (Structures) School, Class A, training for Mental Group IV Personnel. This training consists of a sequency of three courses. It was found that 50% of the Group IV students would have been dropped from training prior to the completion of the sequency while the normal attrition rate does not exceed 1% in any of the three courses. The Group IV students had their greatest difficulties with relatively abstract materials in the area of mathematics and physics. On performance tests and shop projects their work was on a par with that of the regular students. The current training sequency does not seem to be suitable for use with Group IV students.

Utilization and Effectiveness of Phase I and Phase II Fire Control Technician Graduates. SRR 68-14, January 1968. Lloyd S. Standlee, Chester R. Bilinski and John C. Saylor.

A survey was made of 302 Phase I/Phase II graduates, seaman through second class petty officer, assigned to 40 ships in the San Diego/Long Beach area.

In general, Phase I graduates are assigned to gun fire control systems as FTG's, and Phase II graduates are assigned to surface missile fire control systems as FTM's. (The new rating of FTB was not included in the sample.) Both Phase I and Phase II graduates spend considerable time performing non-rating duties.

There were a few job skills that a relatively high percent of the FT's could not perform. On the average, though, both Phase I and Phase II graduates were rated by their leading petty officers as being capable of performing their job skills and of being able to perform them with only limited supervision. It would appear that at least during a first enlistment, the shorter formal training received by Phase I graduates is not a significant handicap to FT's assigned to gun fire control systems.

Prediction Tables for Avionics Fundamentals Course, Class A. SRM 68-15, February 1968. Robert O. Baldwin and Kirk A. Johnson. DDC Availability Number, AD-665 288.

In September 1966 a 16 week Avionics Fundamentals course was implemented in place of the 19 week course. Tables to predict the expected grades of students in the new course were constructed. Graphs for predicting the probability of receiving a setback and the probability of graduating after receiving a setback were also constructed. When moderated by the considered judgment of a counselor or review board, according to special circumstances pertaining to each student, the tables should give good predictions and be an invaluable aid to the counselor.

Programmed Instruction for College Student Learning of Maneuvering Board Solutions: I. "Small Step" Versus "Condensed" Explanation Chapters. SRR 68-16, February 1968. John K. Meyer. DDC Availability Number, AD-665 667.

Completion time for two types of programmed instruction in maneuvering board solutions of relative motion problems was compared using two groups of 10 male college freshmen equated on aptitude. Linear explanation chapters in the first type ("small step") consisted of small, repetitive frames, while the linear explanation chapters in the second type ("condensed") consisted of large frames presenting the same information. The instructional pattern in the two equivalent texts consisted of an explanation chapter followed by a "practice," or problem-working, chapter.

The condensed program was found to require over three hours less reading time for the explanation chapters, a statistically significant difference of over 30 per cent, with no reduction in final examination score. It was concluded that small step explanations of maneuvering board solution methods are unnecessary for personnel of college aptitude.

Further study of varying types of condensed programmed maneuvering board instruction will be required to determine the best type from the standpoint of time saved for use with Naval officer candidates or beginners.

The Class "C" Welding School Output Problem: Analysis and Remedy. SRR 68-19, March 1968. Edward A. Rundquist, NTRL and Beauford E. Myers, LT, USN, OinC, Class "C" Welding School, SSC, NTC, San Diego. DDC Availability Number, AD-669 788.

The course redesign process proved the key to making training, NEC structure, and fleet assignment compatible. Six training packages are specified which permit fleet needs to be more rapidly met by (1) making possible an increase of several magnitudes in use of school capacity, (2) more rapid assignment to meet specific fleet needs, and (3) accomplishing this in a manner that permits long range and continuous improvement in selection, training methods, and the study of measurement problems involved in the present standards for qualification. The proposal will also substantially reduce welding school costs per qualified graduate. The plan will not require an increase in fleet allowance but will require a modest increase in instructional staff. In terms of the magnitude of gains in meeting fleet needs and in reducing effective costs, the problems of implementation appear minor indeed.

Description of Performance and Attrition in U. S. Naval School, Class "C" Welding Courses I, II, III, and V, Service School Command, San Diego. SRR 68-16, March 1968. James A. Caviness. DDC Availability Number, AD-669 789.

There is a serious shortage of qualified welders in the fleet. This research was conducted to identify factors limiting the output of the Class "C" Welding School, San Diego, a major source of qualified welders. The major emphasis in this paper was diagnosis of performance of trainees on welding test projects. The data indicated a need for improved training techniques in relation to changes in position, changes in electrodes, changes in base metals and changes in surface curvature. The need for engineering changes is also discussed.

Evaluation of Graduates of the Electronics Technician Phase A-1 Training Program. SRR 68-20, March 1968. John H. Steinemann, James D. Coady, Robert J. Harrigan and Eugene W. Matlock.

A follow-up assessment of graduates of the Navy ET Phase A-1 training was conducted to determine the job capabilities and assigned responsibilities of four year obligors (4YO's) in the fleet. The sample included 64 Phase A-1 graduates assigned to a total of four shore stations and 29 vessels of the Pacific Fleet. Assessments involved a variety of evaluation procedures and informational sources, and included shipboard evaluations and testing at a shore-based facility.

The results indicate that the 4YO graduates provide some contribution to the total fleet electronics maintenance capability. The role of the 4YO technician within the first six months of fleet service, however, is mainly that of assisting in maintenance rather than working independently, except for routine preventive maintenance tasks.

The 4YO technicians, at the time of testing, showed some lack of experience and facility in working with operating radar and communications equipment. Their proficiency in the use of test equipment is limited both with respect to the diversity and complexity of the test instruments they can properly operate. The 4YO's training in electronics theory appears to be adequate for job performance needs.

It is recommended that, unless Phase A-1 training is augmented, 4YO graduates could and should be utilized primarily in the role of assisting in electronics maintenance until they acquire sufficient equipment experience and skill to assume more independent maintenance responsibility.

Feasibility of Equipment Operator Class "A" School Training for Group IV Personnel. SRR 68-21, March 1968. Lloyd S. Standlee and John C. Saylor.

The performance of 17 Group IV personnel was compared with that of 30 regular recruit peronnel in two classes of the Equipment Operator School, Port Hueneme, California. The classes were conducted in their regular manner, and instructors were not given the identity of Group IV individuals.

Two of the Group IV trainees were set back for disciplinary reasons. None of the Group IV trainees failed the course for academic reasons, though their course achievement test scores were lower than those of the regular trainees, especially on written tests. The single curriculum area causing Group IV trainees the most difficulty was mathematics.

It appears that no major changes are required to enable Group IV personnel to complete the curriculum of the Equipment Operator Class "A" School, though the mathematics portion of the curriculum might be further re-examined with a view toward reducing the extensiveness and the complexity of mathematics instruction if this appears warranted with respect to the mathematics actually required of Equipment Operators on the job.

A Second Investigation of the Feasibility of Navy Commissaryman Training for Group IV Personnel. SRR 68-23, May 1968. Eugene A. Hooprich.

An investigation was conducted to determine the feasibility of providing Navy Class A Commissaryman School training for Mental Group IV personnel. The research was generally similar to a previous study at the Commissaryman School except that the AFQT score level of the Group IVs was lower in this investigation. The achievement of 14 Group IVs was compared with that of 18 regular input personnel in the same eight-week class. Research data were obtained from service records, pretraining and course achievement tests, questionnaires, and interviews with instructors. Although the Group IV personnel successfully completed the Commissaryman training, their course achievement, as measured by typical school tests, tended to be significantly less than that of the regular students in the same class. However, the achievement of the Group IV and regular students was similar when evaluated by actual job performance measures. Statistical analyses of the relationships between pretraining variables and course achievement criteria also were performed. The results are compared with those of the previous investigation at the Commissaryman School.

An Experiment in Basic Airborne Electronics Training, Part V: Evaluation of the Revised Courses. STB 68-10, June 1968. Robert O. Baldwin and Kirk A. Johnson. DDC Availability Number, AD-671 185.

This is the fifth in a series of studies on shortened versions of the Avionics Fundamentals and Aviation Electronics Technician R (Radar) Courses. The first four studies indicated that the initial revisions of the courses led to substantial savings in training time, but that the graduates from the revised courses were slightly inferior to graduates from the original courses on several criteria. It was decided that shortened versions of both courses should be implemented on an operational basis, but that these courses should incorporate certain changes that had been suggested by experience with the first revisions. These changes led to courses that were not quite as short as those produced in the first revision. The current study is an evaluation of the second revisions.

It was found that students in the 8.8 week version of the Aviation Electronics Technician R (Radar) course did just as well as students in the original 10.8 week version of the course. Students in the 16 week version of the Avionics Fundamentals course, however, were found to be slightly inferior to students in the original 19 week version of the course.

Feasibility of Storekeeper Class "A" School Training for Group IV Personnel. SRR 68-25, June 1968. Lloyd S. Standlee and John C. Saylor.

The performance of 14 Group IV personnel who were additionally restricted on GCT was compared with that of 37 regular recruit personnel in two classes of the Storekeeper School, San Diego, California. The classes were conducted in their regular manner and instructors were not given the identity of Group IV individuals.

Eight of the 14 Group IV trainees failed the course, and the six who passed with the assistance of special help and counseling, tended to be at the bottom of the class. The Group IV trainees had great difficulty in learning how to fill out and maintain the required record forms. This difficulty was judged to stem from the reading and the mathematics requirements of the records systems.

In view of the high degree of pencil-and-paper task requirements of the Storekeeper rating and their low probability of success in these tasks, it is recommended that Group IV personnel not be sent to Storekeeper Class "A" School training.

Experimental Modification of Class "C" Welding School Curricula. SRR 69-1, July 1968. James A. Caviness. DDC Availability Number AD-675 030.

The Officer in Charge of the Class "C" Welding School through the Service School Command, San Diego, requested the Navy Training Research Laboratory to carry out research and development aimed at experimental modification of welding school curriculum and at reduction of trainee failure in the courses. Companion studies in the following areas have been reported: Class "C" Welding School attrition rates, certification test projects, and the Naval Enlisted Classification Codes for welders. The present paper reports a task inventory for welding on non-nuclear surface vessels, a translation of that inventory into a set of training exercises, and a derivation of subordinate skills and prerequisite knowledges for training and instruction.

Feasibility of Steelworker Class "A" School Training for Group IV Personnel. SRR 69-8, August 1968. L. S. Standlee and J. C. Saylor. DDC Availability Number AD-679 695.

The performance of 27 Group IV personnel who were additionally restricted on GCT was compared with that of 33 regular recruit personnel in two classes of the Steelworker School, Port Hueneme, California. The classes were conducted in their regular manner, and instructors were not given the identity of Group IV individuals.

All of the 27 Group IV trainees completed the full 12 weeks of training; three, however, failed to meet graduation requirements and were assigned to duty as Constructionman Apprentice without being designated as strikers. The Group IV trainees' achievement test scores, on the average, were lower than those of the regular trainees in all areas of instruction. The differences were greater in academic than in practical areas of instruction. Mathematics caused Group IV trainees the most difficulty.

It appears that no major changes are required to enable Group IV personnel to attend the Steel worker Class "A" School, though the mathematics portion of the curriculum might be re-examined with a view toward reducing the extensiveness and the complexity of mathematics instruction if this appears warranted with respect to the mathematics actually required of Steelworkers on the job.

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An Investigation of the Feasibility of Navy Shipfitter Training for Group IV Personnel. SRR 69-4, August 1968. E. A. Hooprich and E. Ward Matlock. DDC Availability Number AD-675 773.

An investigation was conducted to determine the feasibility of providing Navy Class A Shipfitter School training for Mental Group IV personnel. The achievement of 14 Group IVs was compared with that of 32 regular input personnel in the same 15-week class. Research data were obtained from service records, pretraining and course achievement tests, questionnaires, and interviews with instructors. The course achievement of the Group IV personnel was significantly poorer than that of the regular students and was marginal with respect to the minimum course standards. The performance of the Group IVs was particularly inferior on the course written examinations. Statistical analyses of the relationships between pretraining variables and course achievement criteria also were performed. It is recommended that no additional Group IV personnel be assigned to Shipfitter training unless the implementation of specified modifications in instructional procedures and selection criteria appears to be practicable.

Maintenance Skills and Knowledge Commonalities for Surface Sonar Technician Profile. WRM 69-1, August 1968. H. M. Worth, J. A. Nobile, and J. A. Gandy.

This report identifies maintenance skill and knowledge areas which are common across sonar equipment functions and sub-functions for selected Sonar Naval Enlisted Classification Codes (NEC's 0407, 0418, 0419 and 0421). The information is intended to assist in the development of new training requirements and programs through identification of common skill/knowledge requirements which exist among different surface sonar systems.

Surface Sonar Technician Personnel Characteristics Inventory and Training Paths. WRM 69-6, August 1968. J. A. Gandy and J. A. Nobile. DDC Availability No. AD 845 009L.

Selected personnel and training data related to the Surface Sonar Program is compiled and arranged for the purpose of meeting information needs of Navy offices and contractor personnel who require familiarization with the background, selection criteria, training paths, and inventory of Surface Sonar Technicians. Computer-assisted techniques were used where possible for retrieval, treatment, and format to provide a ready reference document for planners, developers, and managers of Surface Sonar training programs.

Diagnosis of Performance and Attrition in U. S. Naval School, Class "C" Welding Course IV (NDT), Service School Command, San Diego. SRR 69-10, September 1968. James A. Caviness. DDC Availability Number AD-677 120.

This research was conducted by defining factors which relate the output of Course IV (NDT) of the Class "C" Welding School, San Diego, to the under strength level of the fleet NDT force. The sample used was 100 per cent of the enrollees matriculating during Calendar Year 1967. The areas of investigation were: enrollment, rates of attrition, policies of selection and post-graduate assignment, and initial certification and upgrading. Salient determinants were identified, and areas of investigation were outlined. The data stimulated the recommendation of corrective steps, including both administrative action and research and development.

Follow-Up Performance Appraisal of Avionics and Aviation Mechanics Fundamentals Course Graduates. SRR 69-5, September 1968. Adie V. McRae. DDC Availability Number AD-676 309.

For a number of years, the high cost of training first-term aviation personnel has been a matter of increasing concern to the Chief of Naval Operations. Some evidence exists that the enlisted work effort at the entry-level in the avionics and mechanical maintenance fields does not require extensive prior technical training. To further test this proposition, an experimental reduction of technical training was authorized by CNO (OP-56) for a group of entry-level personnel enrolled in courses leading to their designation as ATN, ATR, AQB, AQF, AX, AE, AMH, and AMS. This reduction consisted of the elimination of the specific equipment course portions of the "A" schools of these ratings. The performance of the experimental group of fundamentals graduates (FGs) in their Fleet billets, thus, would constitute a test of the feasibility of reducing the initial technical training of entry-level personnel.

The results indicate that the FGs are being utilized in the same manner as the more conventionally trained personnel. Their overall proficiency on the technical dimensions of their work was also found to be acceptable, and not significantly different in quality from other entry-level personnel who have typically completed the full "A" School Package.

Two Track Training for Avionics Fundamentals. STB 69-1, September 1968. Kirk A. Johnson and Phyllis A. Salop. DDC Availability Number, AD-678 348.

An experimental two track training system, developed for use in the Avionics Fundamentals course, was evaluated against the conventional one track training system. The conventional course lasted 16 weeks. The two track system consisted of a regular track that was identical to the conventional 16-week course and an accelerated track that lasted 10 weeks.

Students were graded on a scale with a maximum of 99, an "average" of 75, and a minimum passing grade of 63. Students in the two track system made grades that were, roughly, one point lower than those made by students in the one track system. This difference decreased to, roughly, half a point in subsequent courses. The two track system provided a reduction in training time of 1.38 weeks per student. This amounts to a savings of approximately 181 student man years per year.

The Development and Evaluation of Training Methods for Group IV Personnel I. Orientation and Implementation of the Training Methods Development School (TMDS). SRR 69-12, October 1968. J. H. Steinemann. DDC Availability Number AD-679 174.

This investigation is part of continuing Navy research on the trainability of Group IV personnel, intended to maximize the utilization and integration of marginal personnel in the fleet. An experimental Training Methods Development School (TMDS) has been initiated to provide an experimental training program, with research controls, for evaluation of the relative effectiveness of alternative training content and methods for Group IV personnel.

The curriculum of TMDS is composed of courses in skill and knowledge areas which have been identified as the most suitable and utilizable areas of proficiency for newly assigned unrated personnel aboard ship.

Trainees of the first three classes, representing the complete range of Group IV scores, were taught a variety of meaningful skills and knowledge despite limitations in verbal and mathematical abilities. Successful training of marginal personnel appears to involve minimizing reliance upon those aptitudes which are known to be limited, and capitalizing upon other important aptitudinal and experimental variables.

Future TMDS research will continue to evaluate alternative training methods and content, with some modification of school selection criteria.

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Comparative Evaluation of the Performance of Group IV Personnel in an Enlisted Skills Training Course (Lookout and Recognition). SRM 69-9, 1968. John H. Steinemann and Nicholas Van Matre. DDC Availability Number AD 679 695.

This limited study is part of a broad series of investigations concerning the trainability of Group IV personnel (AFQT scores 10 through 30).

The performance of a sample of 90 Group IV personnel was compared to that of a concurrent sample of 100 non-Group IV's in a short enlisted skills training course (Lookout and Recognition). The Recognition phase criterion test involves perceptual identification of ships and planes, and is less verbal than the Lookout test which involves both reading and writing skills.

The achievement mean of the Group IV sample was significantly lower than that of the non-Group IV sample in both the Lookout and in the Recognition phase of training. The Group IV sample did relatively more poorly in Recognition training than it did in Lookout training. The failure rate of the Group IV's was also substantially higher than that of non-Group IV's in both training phases. AFQT score was significantly correlated with training achievement scores for the total combined sample.

Despite the relatively inferior mean performance of the Group IV sample, a substantial proportion of the trainees did successfully complete training, and are reportedly assigned to lookout duties aboard ship.

Identification of Difficult Units in a Training Program. STB 69-4, January 1969. Kirk A. Johnson and Larry G. Harding. DDC Availability Number, AD-684 785.

Student opinions, instructor opinions, and conventional norm-referenced tests were evaluated as means for determining the relative difficulty of various parts of a training sequence. There was fairly close agreement between student opinions and instructor opinions, but neither provided a good estimate of the index based on the norm-referenced tests. There were wide fluctuations in agreement over the four studies reported. In one of the studies, comparisons were made between the three indexes mentioned above and a fourth index derived from criterion-referenced tests. Each of the former accounted for between 20 percent and 30 percent of the variance in the latter. It was concluded that none of the three estimates provides a safe substitute for an index based on criterion-referenced tests.

Modification of Class "C" Welding School Curriculum for Welding of Nuclear Power Plant Components: Task Inventory and Training Materials. SRR 69-16, January 1969. James A. Caviness. DDC Availability No. AD-854 779.

The Officer in Charge of the Class "C" Welding School through the Service School Command, San Diego, requested the Navy Training Research Laboratory to carry out research and development aimed at experimental modification of welding school curriculum and at reduction of trainee failure in the courses. The present paper reports a task inventory for welding of nuclear power plant components, a translation of that inventory into a set of training exercises, and a derivation of subordinate skills and prerequisite knowledges for training and instruction.

Second Study of Equipment Operator Class "A" School Training for Group IV Personnel. SRR 69-19, January 1969. L. S. Standlee and J. C. Saylor. DDC Availability Number, AD-684 784.

The performance of six Group IV personnel was compared with that of 16 regular recruit personnel in a class at the Equipment Operator School, Port Hueneme, California. The classes were conducted in their regular manner, and instructors were not given the identity of Group IV individuals.

Two of the Group IV trainees were set back for motivational and academic reasons. None of the Group IV trainees failed to complete the course with passing grades, though their course achievement test scores were lower than those of the regular trainees, especially on written tests. The single curriculum area causing Group IV trainees the most difficulty was mathematics. When only Group IV personnel are considered, AFQT score is not predictive of course achievement.

These results were in agreement with an earlier study. Thus it appears to be fairly well substantiated that no major changes are required to enable Group IV personnel to complete the curriculum of the Equipment Operator Class "A" School.

The Development and Evaluation of Training Methods for Group IV Personnel II. Training Group IV Personnel in the Operation of the Electronic Multimeter AN/PSM-4. SRR 69-22, March 1969. J. C. Steadman, C. R. Bilinski, J. D. Coady and J. H. Steinemann.

This study is part of continuing Navy research on Group IV trainability, intended to maximize the utilization and integration of marginal personnel in the fleet. Specifically the study investigated the feasibility of teaching Group IV personnel a course in the operation of the AN/PSM-4 multimeter, and evaluated the relative effectiveness of two different instructional methods.

The multimeter course was administered to two successive classes of the Training Methods Development School (total N=31). One-half of each class was taught by an instructor while the remaining half received the same course content from a programmed text.

Performance data show that none of the groups as a whole achieved mastery of the operation of the AN/PSM-4 although there was an appreciable range of individual achievement within groups. Although the test performance of the first programmed group was inferior to that of instructor-taught groups, appropriate revision of the text for the subsequent programmed group resulted in achievement scores comparable to those of the instructor groups.

Under time and method conditions similar to those of the present study, it appears the test equipment course is not practical and appropriate for group IV personnel. Findings indicate that results obtained with the programmed approach are comparable to those obtained with the instructor method, provided that the level of the programmed text is appropriate for the background and aptitudes of Group IV personnel.

Evaluation of Torpedo MK 46 Intermediate Level Maintenance Training. SRR 69-26, March 1969. Macy L. Abrams and David D. Eskew, TMCS, USN.

This report describes an evaluation of the adequacy of the prerequisite and Class "C" turnaround (maintenance) training given the Torpedo MK 46 Mods 0 and 1 Torpedoman's Mate, TM NEC 0746 and/or 0747. The evaluation included 111 subjects who comprised nearly the total population of Torpedo MK 46 graduates assigned to operational torpedo turnaround shops in the United States at the time of the study. The shops included installations aboard ADs, CVSs, and shore stations, and a technically qualified examining team personnally administered, on site, all evaluation vehicles. Evaluation instruments designed for the study included a comprehensive performance test, a written troubleshooting test, rating scales, interviews, and proficiency rankings.

The results of the evaluation indicated that: (1) the present Torpedo MK 46 turnaround training is basically sound; (2) the two-week, rather than the 12-week AUWC, course should be used as the prerequisite course for the MK 46 turnaround course; (3) the prerequisite course should include two days of instruction on solid state fundamentals and eight days on front panel operation of the standard test instruments used to turnaround the MK 46; (4) the current 11-week turnaround course should be expanded to 12 weeks to provide an additional three days on film reading and two days in forebody turnaround; (5) more emphasis, guidance, and direction should be provided within the present time constraints on afterbody turnaround and on understanding the OP and what is being accomplished or established during forebody turnaround; (6) students should be provided forebody troubleshooting experience by programming malfunctions into the testing proceedures; and (7) that the MK 46 TM should be provided continuing MK 46 turnaround experience upon completion of Class "C" School Training.

The Relative Efficiency of Pretesting and Two Types of Programmed Instruction for Solving Maneuvering Board Problems. SRR 69-20, March 1969. J. K. Meyer. DDC Availability Number, AD-689 104.

Study time for a large frame and a small frame type of programmed explanation in maneuvering solutions was compared using two equated, pretested groups of enlisted men in a basic CIC techniques course, and two equated groups assigned to basic electricity and electronics training. It was found that, by using pretesting, as many as 60 percent of the CIC techniques students could save study time by entering the learning program at an advanced level, and that as much as 42 percent of study time (e.g., over two and one-half hours in the first six of the explanation chapters alone) could be saved by using a few large rather than many small frames.

Factory Training Course Analysis for the Ship's Self-Contained Navigation System (SSCNS). WRM 69-24, May 1969. E. F. McGonagle. DDC Availability No. AD 852 446L.

This study examines the factory training course on the Miniature Inertial Navigation System (MINS) (the Ship's Self-Contained Navigation System (SSCNS) minus the radiometric tracker). As a result of this course evaluation, subject areas requiring additional emphasis or less emphasis can be reworked and the change incorporated in the Navy formal training.

Procedures for Determining Personnel Requirements for Training Functions of Navy Fleet and Bureau of Naval Personnel Training Activities - Supervisors. WRR 69-6, May 1969. James H. Swann. DDC Availability No. AD 853 984.

This research report presents the final results of research concerned with the development of procedures for determining the number and quality of technical and training supervisors required for enlisted skill training in Navy fleet and BuPers training activities. The end product of the research is presented in Appendix B to the research report as a proposed addition (CH-1) to BuPers Instruction 1510.105 which contains procedures for determining instructor requirements for enlisted skill training.

The procedures establish the man-hour workload of supervisors as derived from the preparation and related duties of instructors, plus military duties of supervisors and then calculation of the number of supervisors required to perform the established man-hour workload.

Field tests of the procedures indicate that it provides a valid, practical, and operationally feasible way to determine supervisor requirements for Navy enlisted skill training at fleet and BuPers enlisted Schools.

Programmed Instruction in Technical Training. SRR 69-28, June 1969. G. Douglas Mayo. DDC Availability Number, AD-690 897.

This report summarized research findings pertaining to programmed instruction and experience gained in the use of programmed instruction in the Naval Air Technical Training Command over a six year period ending in 1969. Overall evaluation of the program indicated that programmed instruction had made a major contribution to training efficiency during the period and that considerable potential for further gains existed.

A Comparison of Class "A" School Performance of Directly Procured and Non-Directly Procured Navy Recruits. SRM 70-5, August 1969. Patricia J. Thomas. Unpublished Report. For Internal Use Only.

Preenlistment school-guarantee recruitment programs have been criticized because they tend to fill the Class "A" school quotas, leaving fewer openings for many highly qualified recruits. The programs have survived, however, because of the competition among the services to attract capable men, and because it is believed men who seek school guarantees show desirable motivation for specific kinds of training. It has been noted for some time that men directly procured with a school contract frequently have lower selection test scores than the recruits who were or could have been assigned to Class "A" schools through the usual classification procedure. Little is known about the differences in school performance of the two groups.

Mean selection test scores and mean final school grades for directly procured and non-directly procured students were contrasted at 11 Navy "A" Schools. An additional analysis compared the school performance of men assigned to their first, second, or third-or-lower choice of schools.

In general, while the directly procured men entered service schools with somewhat lower aptitude test scores, they tended to earn higher final school grades. The student's choice of schools, as reflected in the assignment recommendation, was unrelated to school performance. The selection test score was the only consistently significant factor--method of procurement and choice of school were less important. It was concluded that school guarantee programs of enlistment, as practiced, do not lower the quality of Class "A" school graduates.

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Retention of Electronic Fundamentals: Differences Among Topics. STB 70-1, August 1969. Kirk A. Johnson. DDC Accession Number AD 699 156.

Criterion-referenced tests were used to measure the learning and retention of a sample of material taught by means of programmed instruction in the Avionics Fundamentals Course, Class A. It was found that the students knew about 30% of the material before reading the programs, the mastery rose to a very high level on the immediate post-test, and that about half of the improvement was lost by the end of the course (an interval of about 96 days). There wase considerable variation in item difficulty (S.D. = 27 percentage points) by the end of the course. Most of this variation was independent of topic difficulty or easures of item difficulty obtained from the early post-tests.

Instructors (who were also experienced technicians) were asked to indicate the items that were most relevant to subsequent instruction or to performance on the job. These ratings were not very reliable. The indicated items did not differ appreciably from the remaining items in terms of student proficiency. It was concluded that if the instructors were correct in their ratings there was enough forgetting to hinder a number of students in learning from subsequent courses and in performing their assigned duties on the job.

Development and Evaluation of an Experimental Course in Applied Mathematics for Group IV Personnel. SRR 70-8, September 1969. Ray E. Main. DDC Accession Number AD 698 288.

The Naval Personnel and Training Research Laboratory is conducting research aimed at developing optimal methods for training marginal personnel (Group IV) in the skills they will need in the Navy. Preliminary investigation of training in mathematics showed that Group IV men need to improve most basic arithmetic skills but that they vary widely in their ability to acquire such skills. To be effective for these personnel, course content and methods must be adaptable to individual needs. Group IV students were found capable of working effectively with an experimental self-study course. The courses was judged to be suitable for experimental training methods evaluation. Plans for further research were outlined.

An Experimental Model Welding Curriculum for the Class "C" Welding School. SRR 70-5, September 1969. Macy L. Abrams, John A. Bishop, LCDR, USN and Harold D. LeRoy, DCCS, USN. NoForn. DDC Accession Number AD 862 848.

The significant technological advances in design and engineering of modern naval ships and their associated systems have created a critical requirement for welders who must weld increasingly more exotic metals to meet substantially higher, more rigid standards. To the extent that training can alleviate this problem, the Officer in Charge of the Class "C" Welding School through the Service School Command, San Diego requested that the Navy Training Research Laboratory assist the school in conducting an integrated research and development program aimed at experimental modification of welding school curricula and at reduction of trainee failure in the courses. This paper reports (1) the results of a welding survey to determine the percentage of time fleet welders weld those selected qualification tasks forming the basis of current welder training, (2) a task inventory for welding tasks on board naval ships, (3) a translation of that inventory into a set of training tasks, and (4) a set of supplemental training and instructional information to aid in the development of the lesson plans.

Three Types of Explanation Programming and the Efficiency of Learning to Solve Maneuvering Problems. SRR 70-7, September 1969. John K. Meyer.

A comparison was made of the study time required for maneuvering board learning programs presenting solution procedures with three different types of explanation; namely a selectively programmed type of explanation, a large frame type, and a small frame type using three equated groups awaiting assignment at the Naval Training Center, San Diego.

The large frame type was found to be the most efficient for maneuvering board instruction.

Training Feedback Study of the Sonar Technician Intermediate Electronics Course. SRR 70-2, September 1969. Hervey W. Stern and Edwin G. Aiken. DDC Accession Number AD 697 278.

The relevance and sufficiency of the sonar technician "A-2" course was examined to determine its appropriateness to the follow-on series of "C" courses. The "A-2" course was designed to provide the theoretical background necessary for maintenance training on various sonar and fire control systems at the "C" level.

In order to evaluate the "A-2" curriculum, a complete inventory of course objectives was presented to both "A-2" and "C" school instructors for rating. The ratings were made in terms of instructional goals (A-2 instructors) or required taining level upon entrance to a given "C" school (C school instructors). In general, the theoretical content was found to be adequate, but certain areas were found to have low commonality between "C" schools. Further knowledge and performance testing of "A-2" graduates was then conducted. These tests were based on critical ratings; i.e., those ratings that indicated a very high degree of commonality among all "C" schools. The students' theoretical knowledge in these key areas was found to be generally superior to that required in the following courses, although a few exceptions were noted. Performance testing indicated an inadequate training level for proper test equipment usage and soldering techniques. Specific course deficiencies are discussed and appropriate changes recommended.

Evaluation of ET Graduates of the Set Six-Year Obligor Training Program. SRR 70-11, October 1969. John H. Steinemann, James D. Coady, Robert J. Harrigan, Eugene W. Matlock and Joe C. Steadman. DDC Accession Number AD 699 926.

A follow up assessment of graduates of Selective Electronics Training (SET) for Electronics Technicians (ET) was conducted to evaluate the job capabilities and the shipboard utilization of six-year obligors (6YO's) in the fleet. The sample included a total of fifty-one 6YO graduates who were assigned to the Pacific Fleet and located aboard a total of twenty-nine different vessels representing fifteen ship types. Assessments involved a variety of evaluation procedures and included shipboard interviews and testing at shorebased facility.

The results indicated that 6YO technicians are generally being appropriately utilized in the fleet and are capable of performing their assigned maintenance duties with reasonable competence. In comparison with the minimally trained 4YO's they are more immediately assigned to rating duties aboard ships and are more capable of assuming independent equipment maintenance responsibilities. Despite this relative competence, performance tests revealed some difficulties in troubleshooting, particularly in precise casualty location, and in use of test equipments.

Although the present sequence of SET formal and informal training experiences appears adequate, all phases of ET training could benefit from increased emphasis upon troubleshooting performance, particularly with complete equipment systems.

Fleet Follow-Up On Group IV Graduates of "A" Schools. SRR 70-12, October 1969. Adolph V. Anderson, John C. Saylor, Chester R. Bilinski, and Lloyd S. Standlee. DDC Accession Number AD 697 934.

A nineteen-item questionnaire designed to elicit information relative to work performance, potential, and adjustment was developed and mailed to the duty stations of Group IV men who had previously been assigned to regular Class A schools to determine whether or not they could successfully complete training in essentially unmodified courses. Questionnaires were also mailed for a matched sample of non-Group IV men who attended the Class A schools with the Group IV men. Questionnaire results were tested by chi-square for the significance differences between the Group IV and Control responses, and an index of overlap between the two distributions was calculated. Thirteen of 30 chi-squares had values large enough to be quite improbable on the basis of chance alone. The largest chi-square and the smallest extent of overlap occurred for the analysis of achieved pay grade. Highly significant differences also occurred for items dealing with such areas as length of time to learn job, quality of work, and supervision needed on the job. The smallest differences were for items dealing with accident rate and how well the man got along with his shipmates. Several recommendations are made for administrative action.

A Performance-Oriented Electronics Technician Training Program V. Final Fleet Follow-Up Evaluation of Graduates. SRR 70-13, October 1969. Nicholas H. Van Matre and Robert J. Harrigan. DDC Accession Number AD 678 795.

An investigation was made of the job proficiency of the graduates of an experimental job-oriented training program for Electronics Technician (X-ET). This program was designed to train lower-aptitude personnel, in a relatively shorter time to assume ET duties in the fleet.

The fleet performance capabilities of fifty-one X-ET's and a matched sample of forty-three Class A School graduates (A-ET's) were assessed by performance ratings and structured interviews with the technicians' supervisors after the technicians has experienced approximately 24 months duty in the fleet. The X-ET group was rated comparable in overall technical performance although sampling differences in aptitude and length of training favored the A-ET group. The A-ET's were rated as being more capable in the specific areas of electronics troubleshooting and in the use of test equipment. The A-ET's tended to be in higher pay grades than the X-ET's, although the expressed career intentions for both groups were highly similar and at least 70% of both sample, had completed one or more electronic training courses beyond their original ET training. Generally, the experimental ET program successfully trained marginally qualified personnel, in a relatively shorter period of time, to perform satisfactorily the duties of the Electronics Technician rating.

Radar Operator Task Description. SRM 70-7, November 1969. WO1 Steven S. Ross and John P. Smith. DDC Accession Number AD 862 387L.

To aid in the revision of training courses and the construction of proficiency tests, it is necessary to have a complete description of each ASW operator's task. No such description existed for the RADAR operator; this report provides such a description.

Previous work in this program has included development of task descriptions for JEZEBEL, MAD, and JULIE. This report contains the task description for the AN/APS-88, AN/APS-20, and AN/APS-80:AN/APA-125 RADAR.

All organizations giving training to RADAR operators should review both the training content and the amount of practice provided to insure that trainees and operators master all steps included in this task description. Similarly, operator proficiency testing and other forms of evaluation should be consistent with this task description.

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Programmed Instruction for Selected CIC Watch Officer Tasks: II. An Experimental Evaluation of the Audio Notebook in the Teaching of the Allied Naval Signal Book. SRR 70-16, January 1970. John F. Brock. DDC Accession Number AD 700 256.

This research evaluates oral program instruction used with a multitape recorder, the Audio Notebook (Manufactured by Electronic Futures, Inc., North Haven, Connecticut), as a means of promoting adaptation to student differences and flexibility in instructional scheduling. Use of the Allied Naval Signal Book required by the CIC watch officer position was programmed for the Audio Notebook in terms of the same learning objectives as currently stated for the FAAWTRACENSD course for the watch officer. The oral learning program took less time, much less for those with Navy experience, and achieved the objectives better than the classroom lecture method. The Audio Notebook proved resistant to down-time. This makes it potentially useful for shipboard training. The learning program developed can be used in any school or shipboard situation where the learning objectives correspond to those of the watch officer course in which it was evaluated. It can be readily expanded to include additional objectives which might be needed.

A Survey of Training-Related Utilizations of Television. SRR 70-19, February 1970. Ruth A. Hansing and Eugene W. Matlock. DDC Accession Number AD 701 698.

This report provides a broad survey of the current state of television training technology in civilian and military situations including detailed information concerning a variety of specific applications at local Navy training facilities in the San Diego area. The relative effectiveness of the existing conventional and unique utilizations of television is studied and recommendations are made regarding the feasibility of applying existing systems to other Navy contexts or to developing modified or innovative systems.

The research information presented includes data pertaining to specific equipment types, personnel requirements, cost and training factors associated with typical television systems.

The effectiveness of television as a potent and diversified training tool is confirmed in a wide variety of research findings and demonstrated in a broad range of operational training situations. The most prevalent training use of television is simply as a device to present filmed instruction in a classroom. The more effective utilizations of television, however, appear to be those applications which capitalize on the unique capabilities of the medium, such as in providing immediate performance feedback or in supplying visually programmed task direction.

An Evaluation of Two Short Vietnamese Language Courses. SRR 70-23, March 1970. Alvin J. Abrams and Edward J. Pickering. DDC Accession Number AD 703 239.

The Commander Naval Amphibious School (COMNAVPHIBSCOL), Coronado, California, who is responsible for the Vietnamese language training of certain naval officer and enlisted personnel who are enroute to assignments in Vietnam, requested this Laboratory to investigate the adequacy of their language training and to implement and evaluate any training modifications which appear appropriate. Courses of two- and six- weeks are offered; they are designed to meet the language needs of river boat crewmen and advisors.

On the basis of the research described in the report, it is concluded that:

1. The average graduate of either course was able to meet most objectives, which were derived from the course content. Students were able to acquire limited vocabulary and conversational skills from these short courses.

2. Students with higher language aptitudes were especially successful in the six-week course.

3. The success of the program with respect to objectives which were derived from the existent course does not insure the validity of training; course validation results indicate at least a fair amount of inefficiency. Many students do not use what they have learned. Changes which are being made at request of Commander Naval Forces Vietnam (COMNAVFORV) appear to be in the right direction.

The Development, Conduct, and Evaluation of an Experimental Class "C" Welding School Training Program for the E-6011 Electrode. SRR 70-24, April 1970. Michael N. Carr and Macy L. Abrams. DDC Accession Number 869 132L.

A group which received individualized instruction was compared to a group which did not receive individualized instruction on the two final projects in the E-6011 and E-7018 electrode (6011 and 7018) phases of the plate welding course. The group receiving individualized instruction was significantly better than the group which did not receive individualized instruction on both final projects in the 6011 phase and one of the final projects in the 7018 phase; the difference on the other project favored the individualized instruction group but was not significant. On the basis of these results it is recommended that individualized instruction be used in the arc welding courses at the Welding School in order to reduce the failure rate and the average time required to train a welder.

Procedures for Determining Personnel Requirements for Training Functions of Fleet and Bureau of Naval Personnel Training Activities - Instructors and Supervisors for Officer Skill Training. WRR 70-8, April 1970. C. O. Brazil, E. S. Perry and J. H. Swann. DDC Availability No. AD 704 909.

This research report presents the final results of research concerned with the development of procedures for determining the number of instructors and technical and training supervisors required for officer skill training in Navy fleet and BuPers training activities. The end product of the research is presented in Appendix B to this report, which has been incorporated in BuPers Instruction 1510.105A.

The instrument includes procedures for establishing the man-hour workload of instructors as derived from their instructional, preparation, related, and military duties; and then calculation of the number of instructors required to perform the established man-hour workload and the number of supervisors that are required to supervise the instructors.

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Classroom Exercises for Training Combat Information Center Watch Officers in Tactical Decision Making: I. Preliminary Evaluation of Monitoring Exercise I. SRR 70-30, May 1970. Eldon W. Riley and Richard E. McCutcheon, Jr. DDC Accession Number AD 707 053.

This research evaluates the preliminary results obtained from using a classroom exercise, consisting of multiple slides presented simultaneously and sychronized with internal and external voice transmissions, for training combat information center watch officers (CICWOs) in the areas of monitoring and evaluating. The exercise was designed in terms of learning objectives as currently stated for the Fleet Anti-Air Warfare Training Center (FAAWTRACEN), San Diego, course for the watch officer. Using the Classroom exercise provides more training time, and a more efficient method of evaluating student performance in comparison with the traditional method of using a mock-up simulating a combat information center. Training is therefore less expensive. This makes the classroom exercise potentially useful for training large numbers of students simultaneously in the area of decision making, and providing a method in which student performance can be measured; thereby detecting areas wher instructional procedures may need improving, or students require additional instruction in order to achieve the performance standards as stated in the learning objectives.

Development and Evaluation of Computer Assisted Instruction for Navy Electronics Training: I. Alternating Current Fundamentals. SRR 70-32, May 1970. John D. Ford, Jr. and Dewey A. Slough. DDC Accession Number AD 706 728.

This report presents results of development and evaluation of the first computer assisted instruction (CAI) course segment for basic electronics. Following student tryout and revision the CAI segment was evaluated by comparing achievement scores and learning time of students who received training on the CAI segment with students who received normal classroom training. Fifty-one students were randomly selected from classes and assigned to CAI training, and the remaining two hundred students in these classes served as the control group. At the end of training both groups took the standard school examination on this segment and a supplementary test which covered school objectives not tested by the particular school examinations in use at the time. The CAI students scored significantly higher than classroom students on both the school examinations and supplementary test. These results were consistent across all four ability tracks. CAI training resulted in more nearly uniform student achievement across all training objectives. Faster learning was produced by CAI than lecture-based training with time savings ranging from 33 to 44 percent in the various ability tracts.

Development, Conduct, and Evaluation of Experimental Class "C" Welding School Training Program for Plate Welding: I. Intensive Observation of an Experimental Welding Class. SRR 70-29, May 1970. Kirk L. Gibson and Macy L. Abrams. DDC Accession Number AD 870 056L.

A fundamental factor in maintaining a sufficient force of welders in the Navy is the need for an improved training technology. Ten trainees were intensely observed and extensively questioned during a four-week experimental class for selected arc welding applications. From the observations, an analysis of the arc welding skill was made, and, from this analysis, implications for training methods were derived. Welding skill development essentially was found to be a learning process in which the desired skills must be incorporated into the behavioral patterns of the trainee despite a complex stimulus situation, interference from mistakes and old habits, and poor feedback. Recommendations for improved training methods included discussion of training aids, graduated training exercises, programmed instruction, an instructor's manual, and training devices.

The Effectiveness of Flash Cards in a Mathematics Self-Study Course for Group IV Personnel. SRM 70-20, June 1970. Ray E. Main. DDC Accession Number AD 707 718.

The Naval Personnel and Training Research Laboratory is conducting research aimed at identifying optimal methods for training Navy personnel who have achieved marginal scores on military selection tests. In the present study, flash card instruction methods were adapted for application to a comprehensive range of basic mathematical operations involved in a previously developed course in fundamental mathematics. Supplementing the standard course work with flash card instruction did not result in significantly higher performance gains. It was concluded that applying flash methods to the relatively wide range of content complexity involved in this study was not effective. It is pointed out that this investigation should not be interpreted as challenging the usefulness of flash cards as typically employed.

A Study to Examine the Feasibility of Developing a Miniature Inertial Navigation System Simulator. WRM 70-48, June 1970. C. P. Fiackos. DDC Availability No. 871 899L.

This study examines the feasibility of developing a Miniature Inertial Navigation System (MINS) Binnacle Simulator for training purposes.

A Comparative Evaluation of Group IV Personnel Assigned to the USS CATSKILL: Follow-Up Performance Evaluation. SRR 71-1, July 1970. Nicholar H. Van Matre and Robert J. Harrigan. DDC Accession Number AD 711 298.

A follow-up performance evaluation was conducted on a sample of Group IV personnel who had served 14 months aboard the mine countermeasures support ship USS CATSKILL (MCS-1). Shipboard assessments were made of the Group IV sample (N=47) and the non-Group IV comparison sample (N=35) in terms of performance test proficiency, supervisors' ratings, and other variables including rate of advancement, and disciplinary records.

Results from the actual performance tests indicated no significant difference between samples in test task proficiency. The Group IV men did score lower on a written General Navy Knowledge Test and were rated lower than the non-Group IV personnel on two different supervisors' rating scales. The Group IV personnel experienced more disciplinary actions, completed fewer training courses, and advanced in pay grade at a slower rate than did the non-Group IV men. In general, the results of this study substantiated the trends reported in the initial CATSKILL evaluation. Considerations regarding the feasibility of shipboard utilization of Group IV personnel were presented.

Investigation of the Need for Motion in the Teaching of a Complex Motor Skill. SRR 71-5, August 1970. Jim C. Fortune, John R. Petry and Larry G. Harding.

This report describes a comparison of a medium which allows motion (video-tape) and one which doesn't (slide-tape) in the teaching of complex motor skills (lockwiring). Due to the differences in cost and in convenience of administration, it was deemed desirable to see if the video-tape produced significantly better results.

The results showed no significant differences in achievement, length of time to perform the tasks, clarity of presentation, or pacing of instruction. It was concluded that complex motor skills can be adequately taught by a slide-tape presentation which requires the student to perform the motor skills as the proper procedures are presented.

Job Training Course Design and Improvement (Second Edition). SRR 71-4, September 1970. Edward A. Rundquist. DDC Accession Number AD 876 204.

The second edition of the Course Design Manual is a thorough revision of earlier editions. The Manual is designed to assist instructors in developing and improving job-related training courses. Major changes from earlier editions include more careful definitions of training and training related terms; a general clarification of concepts and procedures, especially those concerned with job and skill analysis for training purposes; more emphasis on principles of developing training exercises; a more thorough consideration of the importance and means of adapting individual differences; and more emphasis on the significance of the course mission for course design. Examples from a wide variety of duty assignments are included.

The Effect of Periodic Tests on the Amount Learned from Programmed Instruction. SRR 71-6, October 1970. Kirk A. Johnson and Ermon M. Evans.

The purpose of this study was to determine whether the amount learned from programmed booklets could be increased through the use of short tests given on the day following the completion of each booklet. It was found that the tests provided an improvement of about 7% on a special, criterion referenced test, and a smaller, statistically unreliable improvement on the standard unit test. The study was done in the first, three-week unit of the Aviation Fundamentals School, Class A.

An Evaluation of Five Group-Paced Audio-Visual Programs. SRR 71-10, October 1970. Kirk A. Johnson.

An experimental instructional system, based on a series of five group-paced, audio-visual programs, was evaluated against the conventional instruction it was designed to replace. It was found that the experimental system provided a substantial improvement in student proficiency. Part of this improvement was found to be associated with the new organization of material and the revised study guides used with the experimental system, but a major part was associated with the audio-visual programs themselves.

Printed-Circuit-Board Soldering Training for Group IV Personnel. SRR 71-11, October 1970. E. A. Hooprich and E. W. Matlock. DDC Accession No. AD 713 639.

As part of a larger program to determine which Navy skills can be learned by lower aptitude personnel and to ascertain what methods are most effective for accomplishing such training, an experimental course in printed-circuit-board soldering was administered to 186 Mental Group IV students in 13 classes. Two different training approaches--one stressing instructor guidance and the other featuring reliance on film viewers--were evaluated. Research data were obtained by means of questionnaires and both paper-and-pencil and performance tests. The soldering proficiency of the Group IVs was compared with that of experienced Navy technicians, and tests designed to measure transfer of the skills learned

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in the course also were constructed and administered to selected classes. The major research findings were (1) that Group IVs can learn the rather exacting skills required for a task such as printed-circuit-board soldering but require a considerably longer training period than other Navy personnel and (2) that the film-viewer method of training is an effective alternative to conventional methods of teaching soldering and was preferred by the Group IV personnel. Recommendations for implementing the research findings into Navy technical training are presented, and other current and planned research projects are briefly discussed.

Retention of Electronic Fundamentals: Differences Among Students. STB 71-2, October 1970. Kirk A. Johnson.

Criterion-referenced tests were given to students in an electronics course at various points following original learning. It was found that there was little variability on an immediate post-test, but that by the end of the course (a delay of about 3 months), variability was almost as large as it was on the pre-test. The relative position of students remained fairly stable over all testing points, but there were sizeable shifts in the relationships between aptitude and proficiency.

Training Feedback on the AN/SRC-20, 21 Radio Sets. SRR 71-9, October 1970. Chester R. Bilinski, John C. Saylor and Lloyd S. Standlee. DDC Accession Number AD 713 090.

A job analysis was made of the maintenance requirements of the AN/SRC-20, 21 Radio Sets. Based upon the job analysis, a structured interview, check lists, and a card sort were used to obtain information from a fleet sample of technicians concerning their experiences in maintaining the AN/SRC-20, 21.

The most frequently occurring maintenance tasks were those involving operational checks and adjustments. The test equipments used most frequently were the AN/URM-43C RF Wattmeter and the AN/USM-116 Electronic Multimeter.

The specific equipment maintenance task causing the most difficulty was alignment of the AN/URC-9. There were also some problems concerning the use of the Technical Manual, lubrication, and test equipment. The particulars of maintenance difficulties--identified by component and by location in the "C" School curriculum--are described in the Appendix of the Research Report.

On-Line Encoding of Voice Net Messages for Computer-Assisted Trainee Performance Evaluation. SRR 71-12, December 1970. David J. Chesler, Harry E. Vandevort and George D. Tice. DDC Accession Number AD 716 761.

Purpose of study was to develop and evaluate an essentially on-line method of entering voice net information into a digital computer system in order to facilitate: (1) computerized evaluation of trainee performance in mock-ups of conventional Combat Information Centers (CIC); (2) reconstruction of live exercises at sea. The method investigated was a combination of manual alpha-numeric encoding on prepared forms followed by entry into the computer system via keyset. The simulation system utilized was the Tactical Advanced Combat Direction and Electronic Warfare (TACDEW) complex at the Fleet Anti-Air Warfare Training Center, San Diego. A requirement for many mock-ups in this complex is to record into the computer system various trainee responses which are reflected in voice messages. The audio material consisted of recordings of the Combat Information/Direction (CID) and Air Control (AC) voice nets during simulated anti-air warfare exercises.

Accuracy of encoding based on number of messages available was 90.8 and 82.6 percent for the two nets respectively; and 97.8 and 94.0 percent based on number of messages attempted. Corresponding accuracies for the keyset task was 97.3 and 99.1 percent. The procedure is recommended for implementation in simulated and real environments.

The Reliability of Expert Opinion in Specifying Course Content. STB 71-4, December 1970. Hervey W. Stern. DDC Accession Number AD 716 760.

In the development and revision of curricula, subject-matter experts are frequently called upon to aid in specifying skill or knowledge requirements and to provide opinions on the degree of importance associated with the requirements for the establishment of a curriculum. If, however, these expert judgments are not reliable, their validity is automatically questionable. The effect of individual differences in reliability mav not be given sufficient consideration.

In order to evaluate this problem, data from a previous study was supplemented and analyzed for rate-rerate reliability of a group of Navy subject-matter experts, including an analysis of individual differences.

The rate-rerate reliability for all 16 judges over a six month period was .59. Absolute changes in rating averaged slightly over half a scalar unit on a 6-point scale. When four raters were selected on the basis of their individual reliability, their combined rate-rerate reliability was .68. Other measures indicate the selection of raters on an index of individual stability may increase reliability, although the effect this has on validity is not known. These findings indicate that a large number of raters does not insure high reliability, and that selecting a subset may result in an increase in precision in overall reliability.

The Determination of Course Objectives for the CMI Version of a Common Core Course (AMFU(A)). SRR 71-8, February 1971. Larry G. Harding and Phyllis A. Salop.

In order to devise a method of curriculum development for the CMI version of the Aviation Mechanical Fundamentals course, certain categories of information taught in this course were identified as necessary prerequisites for student entry into the Aviation Structural Mechanic S (Structures), Class A course or necessary for satisfactory performance in the fleet. In order to empirically determine the validity of the prerequisites identified, a group of students who either knew or were taught the prerequisites was sent directly into AMS(A), bypassing AMFU(A). The performance of these students in AMS(A) and on Advancement in Rating tests was compared with that of a matched group of students who had gone through the normal course pipeline. The statistically reliable differences which occurred were small and were attributable to the multiple-choice tests. There were no statistically reliable differences between the two groups on performance type tests or on Advancement in Rating exams. Post-study conferences were held which resulted in specific policy guidelines regarding the CMI curriculum content. Further, the present Aviation Mechanical Fundamentals course was reduced from four to three weeks, an annual savings of 175 student man years.

Development of Methods and Materials for Soldering Training. SRR 71-19, February 1971. L. S. Standlee, E. W. Matlock and R. J. Harrigan. DDC Accession Number AD 720 308.

Two parallel self-instructional packages were developed for teaching soldering rework on printed circuit boards. One package consisted of 12 five-minute sound films. The other consisted of a 168-page spiral bound book. The effectiveness of the self-instructional packages was compared with that of a parallel instructor-taught course. Subjects for the comparison experiment consisted of 60 students in Basic Electricity and Electronics.

Both self-instructional packages--film and book--were found to be effective media for learning soldering skills. No significant difference was found in the soldering skill gains of film-, book-, and instructor-taught students. The soldering book, though, would have the advantage of being simpler and less expensive to reproduce and to administer.

Development of a "Wordsmanship" Training Course for Marginal Personnel. SRR 71-17, February 1971. J. H. Steinemann, E. A. Hooprich, A. G. Archibald, and N. H. Van Matre. DDC Accession Number 702 306.

This investigation is part of continuing research to determine the trainability of Group IV personnel and to develop optimal content and methods for marginal training. The Wordsmanship course for training basic written language skills was taught as a part of the Training Methods Development Program experimental curriculum. Data were obtained for 176 Group IV personnel in 12 classes trained during the period from September 1968 to June 1970. Evaluations of training effectiveness were based on pre- and post-training tests and measures of student achievement.

The Wordsmanship training has generally proved effective in terms of student achievement of primary course goals, despite a trainee input characterized by low verbal abilities and unfavorable attitudes toward language instruction. Trainees substantially improved their knowledge and proficiency in each of the sub-course areas of wordsmanship, and most students reported a more favorable attitude toward words and a desire for future self-improvement of verbal skills. Training approaches described in this report should be adaptable to other training contexts having similar objectives for marginal personnel.

Evaluation of DS Technician Graduates of the Set Six-Year Obligor Training Program. SRR 71-18, February 1971. J. C. Steadman and R. J.Harrigan. DDC Accession Number AD 720 307.

A followup assessment of graduates of Selective Electronics Training (SET) for Data Systems (DS) Technicians was conducted to evaluate the job capabilities and shipboard utilization of six-year obligors (6YO's) in the fleet.

The assessment evidence indicates that the 6YO DS Technicians are being appropriately utilized within their specialties in the fleet, and that they are generally competent in performing normally assigned maintenance duties. A period of about six months fleet experience is required, however, before graduate technicians are considered by supervisors to be fully qualified. Despite the general level of job competence, performance evaluations reveal some specific deficiencies in troubleshooting and in the use of test equipments.

Suggested training modifications could increase the immediate shipboard utility of graduate technicians and improve their proficiency levels in specific performance areas.

An Experimental Evaluation of an Audio Tape Learning Program for Shipboard Damage Control Central Sound Powered Telephone Talker Procedures. SRR 71-15, February 1971. John F. Brock and Richard E. McCutcheon, Jr. DDC Accession Number AD 719 900.

This research evaluates aural programmed instruction for Damage Control (DC) Central sound powered telephone talkers as a means of promoting adaption to student differences in the shipboard environment. The DC Central sound powered telephone talker is the only link between a shipboard emergency and the Damage Control Assistant (DCA), who must deal with the emergency. There were no qualified DC Control talkers on the vessel under study when this research began. All students on the ship qualified using the program. Additionally, 60 students fresh from recruit training received the program; their improvement was statistically significant. It is recommended that all sound powered telephone talker training be done aboard ship using aural/verbal programmed instruction.

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Development and Evaluation of Computer Assisted Instruction for Navy Electronics Training: 2. Inductance. SRR 71-22, March 1971. Richard E. Hurlock. DDC Accession Number AD 720 309.

This report presents results of development and evaluation of a second computer assisted instruction (CAI) course segment for basic electronics. Three tryout and revision cycles were included in the developmental phase. The test and evaluation phase compared achievement and time measures of students trained on the CAI segment with control students who received regular classroom instruction. Random selection procedures were used to choose 50 students for the CAI treatment and 180 students for the class instructed condition. At the end of the training all students took the standard school examination on this segment and a supplemental test which covered school objectives not tested by the school examinations in use at that time. The CAI students scored significantly higher than classroom controls on the supplemental test and did not differ from classroom students on the school examination. Combined scores for criterion referenced measure showed 10% higher achievement for CAI students. Training time for CAI students averaged 8.75 hours, a time savings of 48% compared to traditional classroom instruction.

Development of a Strategy to Retrieve Information from the Standards Used to Evaluate Welds and Metals by Nondestructive Testing. SRR 71-20, April 1971. John K. Meyer and Macy L. Abrams. DDC Accession Number AD 883 413.

This study reflects the initial research effort to improve the training technology in the nondestructive testing (NDT) training course. A strategy was developed to retrieve information from the Welding Standard NAVSHIPS 250-1500-1, one of the primary military/Navy standards (documents) used to evaluate welds and metals by NDT methods. This strategy, an index and retrieval exercise was then experimentally evaluated by comparing groups using it with those groups not using it. Improvements were demonstrated in the capability of finding inspection topics, the interpretation of inspection topics, and in the length of time required. Recommendations are made for the inplementation of the index and the retrieval exercises, and for developing similar index documents and retrieval exercises for all standards involved in the NDT of welds and metals.

TRAINING AND EDUCATION (Continued)

The Effect of Error Distributions on the Efficiency of Remedial Instruction. STB 71-9, April 1971. Kirk A. Johnson.

Data were collected by means of a criterion-referenced test that covered a representative sample of the topics taught by means of programmed instruction during the first phase of a course in Avionics Fundamentals. Assumptions were made concerning the way in which an individual response would change following an arbitrary unit of remedial instruction, and projections based on these assumptions were used to estimate the way in which the students' scores would change following various amounts of instruction under each of four common strategies for the allocation of remedial instruction. These estimates indicated that the amount of instruction required to produce a given change in average proficiency would vary considerably as a function of the strategy selected, and that the strategy which is best for producing a modest change in proficiency may not be best for producing a larger change in proficiency.

Computer-Assisted Performance Evaluation for Navy Anti-Air Warfare Training: Concepts, Methods, and Constraints. SRR 71-25, May 1971. David J. Chesler. DDC Accession Number AD 724 691.

This report formulates an improved general methodological approach for the development of computer-assisted evaluation of trainee performance in the computer-based simulation environment, and in other training environments where computer capacity is available to record and process trainee response data. This report is part of an ongoing development effort for the Tactical Advanced Combat Direction and Electronic Warfare (TACDEW) system at the Fleet Anti-Air Warfare Training Center (FAAWTRACENSD). TACDEW is a computerized simulation system for individual team and multi-team training for Combat Information Center, Command and Decision, Air Intercept Control, Electronic Warfare, Carrier Controlled Approach, and Air Tactical Data System. Both conventional and Navy Tactical Data Systems (NTDS) are represented. Six basic methodological steps are proposed: Identify system entities; identify major types of operations; and processing; determine situational variables and their recording and processing; analyze and interpret performance data. Follow-on studies are discussed for multi-team (CIC) anti-air warfare, single CIC anti-air warfare, carrier controlled approach, air intercept control, surface maneuvers (radar navigation), and electronic warfare.

An Instrument Reading Training Course for Group IV Personnel. SRR 71-26, May 1971. N. H. Van Matre. DDC Accession Number AD 726 408.

This investigation concerns the development and evaluation of an Instrument Reading Training Course intended to provide Group IV personnel with a practical job skill which could enhance their utility in the fleet. Thirteen classes of trainees (total N=188) completed the short Instrument Reading Course under several different instructional formats. The relative effectiveness of the various training methods was determined by comparing achievement data obtained from pre- and post-training written instrument reading tests.

The course was successful in training Group IV personnel to read Navy measurement devices at a skill level approximating that of experienced non-Group IV men. In this study the most effective method for training Group IV personnel in instrument reading utilized self-study workbooks which contained both instructional material and practice worksheets.

Procedures for Determining Personnel Requirements for Training Functions of Fleet and Bureau of Naval Personnel Training Activities - Administrative Staff for Enlisted and Officer Skill Training. WRM 71-38, May 1971. J. H. Swann and E. P. McCarty. DDC Availability No. AD 724 658.

This report is concerned with the development of procedures for determining administrative staff personnel requirements for enlisted and officer skill training in Navy fleet and BuPers training activities. A recommendation is made for a field test at a sample of fleet and BuPers training activities, review by the Bureau of Naval Personnel, and promulgated as a Bureau of Naval Personnel directive.

Analysis of the operational requirement of training activities indicated that administrative staff requirements were more directly related to the organizational structure of these activities than to the workload of administrative staff members. The essential training functions of the organizational structure of a training activity were, therefore, used as a basis for procedures to determine administrative staff requirements.

The three categories of essential training functions are: Command Functions, Training Plans and Direction Functions, and Administration of Technical Components Functions. These categories of functions became the criterion for judging requirements for administrative staff personnel.

Effects of Establishing a Conceptualization Context for Learning Monitoring and Evaluation Tasks. SRR 72-4, July 1971. Richard E. McCutcheon, Jr. and John Brock. DDC Accession Number AD 726 690.

This research evaluates the effectiveness of a "Concepts of CIC" program in improving performance on classroom monitoring exercises. The function of the combat information center watch officer (CICWO) course is primarily to train CICWOs in monitoring and evaluating. Two versions of "Concepts of CIC" were administered to two groups of students in the course. As compared to a control group which did not receive the program, it was found that administration of the conceptualization program at the beginning of the course significantly improved performance on classroom monitoring exercises in terms of both decision and error detection scores.

A Preliminary Investigation into Shipboard Training Problems. SRR 72-1, July 1971. John F. Brock.

A preliminary investigation into applying the NPTRL course design procedure to a ship's repair party training program is reported. A training system was developed for repair party training which was workable and produced readily detectable improvements. The procedure proved adaptable to shipboard conditions. Most problems of shipboard training reduce to management problems, rather than the actual conduct of training. There is tentative evidence that smaller repair parties, with personnel cross-trained in two or more discreet jobs, would be more efficient. Further research in the shipboard training area is suggested.

Development of a Job Task Inventory for Commanding Officers of Amphibious Ships. SRR 72-2, August 1971. Edward A. Rundquist, Charles M. West and CDR Robert L. Zipse. DDC Accession Number AD 728 390.

This research demonstrates that a high level line officer position, in this case the CO of an amphibious ship, can be defined in terms of a task inventory. This brings together in one well-organized reference the numerous requirements from many sources which affect and regulate this position. It will be used as a basis for revision of the PCO/PXO course at the Naval Amphibious School Coronado. It is recommended that task inventories should be developed for all officer positions on all ship types and used as a basis for the development of a training system compatible with other personnel management systems.

Training Feedback on the AN/WRC-1 Radio Set. SRR 72-5, August 1971. C. R. Bilinski, J.C. Saylor and L. S. Standlee.

A job analysis was made of the maintenance requirements of the AN/WRC-1 Radio Set. The 155 items -- including a few "knowledge" items -- thus obtained were grouped into 35 checklist/card sort/interview items. The items were administered by a research team visiting ships at Long Beach and San Diego, with the total sample including about 20 per cent of all west coast ships having the AN/WRC-1 Radio Set.

When combined with a depth interview about performance, "knowledge" items can be a fruitful source of information about performance difficulties. Grouping of maintenance tasks was found to be less efficient than treating each task as a separate item.

The frequency of maintenance on the AN/WRC-1 was fairly low. The specific equipment maintenance tasks causing the most difficulty were the adjustments and/or checkout of the R-1051/URR Translator Synthesizer Assembly, the R-1051/URR Code Generator, and the T-R27/URT Transmitter and relays. Maintenance problems tended to be associated with difficulty in understanding and using the Technical Manual. The particulars of maintenance difficulties are described in the Appendix.

Development and Evaluation of Experimental Arc Welding Training Procedures and Techniques. SRR 72-6, September 1971. Macy L. Abrams and Michael N. Carr.

The purpose of this research was to develop a training methodology for arc welding and to experimentally evaluate its effectiveness.

Following the recommendations of earlier reports, this study developed and evaluated a skill training package for arc welding consisting of the following: a series of movies, a program for individualized instruction, practical skill training exercises and methods, and programmed skill exercises (job guides) to integrate with programmed instruction (PI) which was developed to provide background information on welding in a systematic manner.

In all cases, use of the skill training package resulted in better performance, and in six out of eight cases, these differences were statistically significant.

The PI did not produce any significant increases in welding skill; however, the average score on the PI quizzes was 91% and suggests that PI is an effective means of imparting welding background knowledge to welding trainees.

Continued use of the training methods developed was recommended. It was also recommended that the search be intensified for methods to provide clear and immediate feedback to welding trainees.

Development and Evaluation of Experimental Silver Brazing Training Procedures and Techniques. SRR 72-8, October 1971. Macy L. Abrams and Michael N. Carr. DDC Accession Number AD 889 224L.

The purpose of this research was to develop a training methodology for silver brazing and to experimentally evaluate its effectiveness. To accomplish this, the following steps were taken: (1) A perecptual-motor skill analysis was conducted to identify proper silver brazing behaviors; (2) an error analysis was conducted to indicate tha major areas of difficulty in silver brazing; and (3) on the basis of (1) and (2) programmed instruction and programmed skill exercises were developed to provide all trainees with the proper silver brazing behavior.

Since the trainees using the new training methods performed significantly better in the two qualification projects which immediately gave them their Fuel Gas Welding NEC, continued use of the newly developed training methods was recommended. However, one major difficulty still remains in training silver brazers and that is in providing clear and immediate feedback to the trainee. The trainee cannot directly see the effects of his torch manipulation, that is, what is happening inside the pipe, and must wait hours to find if his brazing was acceptable. Thus, recommendations were made to install an ultrasonic testing machine in the welding laboratory which would reduce feedback time from several hours to 20-30 minutes, and to investigate the feasibility of using a clear pyrex or glass fitting which would provide immediate feedback.

The Development of a Task Inventory for Training Purposes for the Boilerman Rating. SRR 72-10, November 1971. Edward H. MacAlister and Richard E. McCutcheon, Jr. DDC Accession Number AD 733 672.

This research demonstrates that technical ratings, in this case the Boilerman (BT) rating, can be defined in terms of a task inventory. This brings together in one well-organized reference the numerous requirements from many sources which affect and regulate this position. The inventory is suitable for training and testing purposes and, in addition, can serve as a prototype for the construction of task inventories for training purposes for other technical ratings.

Development and Evaluation of Experimental Core and Magnetic Particle/Liquid Penetrant Nondestructive Testing Training. SRR 72-12, December 1971. Macy L. Abrams and Robert G. Wells. DDC Accession Number AD 735 469.

This study reports on the redesign of a part of the Navy Nondestructive Testing (NDT) School's curriculum and the evaluation of the redesign effort.

Following the course design procedure explicated by Rundquist (1970), the effort resulted in two new NDT package courses: (1) a core training package including material common to all NDT methods and visual testing (VT) and (2) a

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magnetic particle testing (MT)/liquid penetrant testing (PT) training package. The new packages emphasize structured laboratory projects and programmed instruction (as opposed to traditional classroom lectures). In addition, much new material, including nonnuclear NDT applications, was included in the new training packages.

Significant improvement in both the core and MT/PT packages was found as measured by (1) a 38% increase in the rate of school graduation (from 57% to 95%), (2) a 40% increase in the rate receiving at least one NDT NEC (from 52% to 92%), and (3) a 24% increase in the rate certifying for VT/MT/PT inspector, NEC 4931 (from 42% to 66%). Even though the increase of those receiving the NEC 4931 was substantial, it was felt to be less than desirable. This is probably due to poor reliability of the certification exams and to an overemphasis on written certification exams (as opposed to performance tests).

Based on these results it was recommended that: (1) the core and MT/PT packages become a permanent part of the school's curriculum, (2) the certification tests used at the school be validated and standardized, and (3) greater emphasis be placed on performance certification tests.

Information Feedback: Contributions to Learning and Performance in Perceptual Identification Training. STB 72-5, December 1971. Alvin J. Abrams and Richard L. Cook.

In training people to perform auditory identification tasks (e.g., training students to identify sound characteristics in a sonar classification task) it is important to know whether or not training procedures are merely sustaining performance during training or whether they enhance learning of the task. Often an incorrect assumption is made that superior performance during training is synonymous with a high level of learning.

Two experiments were run in which the pacing of stimulus complexity and the fading of informational feedback (IF) were systematically varied.

It was found that:

1. The pacing of stimulus complexity during training serves to enhance the learning effectiveness of IF.
2. Continuous IF serves primarily to sustain performance, while fading IF enhances learning.
3. The learning enhancement effect of IF is greatest when judgments of a stimulus dimension are made on a previously learned absolute scale, while the performance sustaining effect of IF is greatest when judgments of a stimulus dimension are made on a novel, relative scale.

Job-Task Analysis for ET(N) "A" School Training. SRM 72-8, December 1971. ETC John S. Bowman, ETC Patrick F. Costello, Thomas L. Garcio, ETN2 Glenn T. Miller, ETC Paul H. Thorsted, ETCM Robert A. York, Edward A. Rundquist.

Any course design procedure incorporating modern training technology is difficult for typical instructor-designer personnel to follow. This study has demonstrated that technicians in a complex rating [in this case, the ET(N)] can follow a complex course design procedure with little guidance. The accomplishments of an ET(N) team of job-experts with such little guidance has developed an ET(N) "A" School mission and a task inventory for ET(N) "A" School graduates. Not only will the "A" School curriculum be vastly improved but the distinction between "A" and "B" School curricula clarified so that better integration can be achieved. This study threw light on the Naval Personnel and Training Research Laboratory's course design procedure.

Development and Evaluation of Performance-Oriented Test Equipment Training Procedures. SRR 72-11, January 1972. Hervey W. Stern. DDC Accession Number AD 736 917.

The correct use of many different types of test equipment is one of the most basic electronic skills needed by Navy technicians. On many occasions technicians have been found deficient in proper test equipment skills. Several training formats have been developed to improve these deficiencies, but are now either obsolete or have been placed out of current training programs. However, some of the concepts contained in these earlier training materials are still valid.

These concepts and recent training developments were used as a basis in constructing workbooks for the USM-140 oscilloscope and the PSM-4 multimeter. It was felt that the type of training that resulted would meet with high student acceptability and yield appropriate performance levels. In fact, it was found that performance gains over typical lecture-laboratory training was obtained and student motivation was easily maintained by using action-oriented sequences not normally found in test equipment training. While the focus of attention is on the entry level sonar technician, the concepts incorporated into the workbooks are so basic that it is felt the conclusions are applicable to most technical rates.

Procedures for Obtaining Training Feedback Relative to Electronics Maintenance. SRR 72-13, January 1972. L. S. Standlee, C. R. Bilinski and J. C. Saylor.

The advantages and disadvantages of different ways of obtaining training feedback information are reviewed and summarized. The methods are: experimental method, mail-out questionnaire, performance diary, analysis of existing records, rotation of fleet and training personnel, and structured interview.

Structured interview procedures were developed and field tested in obtaining training feedback information on six electronics systems -- the MK 10 IFF System, the AN/SPS-40 Radar System, the AN/ULQ-6 Series Countermeasures Set, the AN/WLR-1 Series Countermeasures Set, the AN/SRC-20, 21 Radio Sets, and the AN/WRC-1 Radio Set. The procedures were also tested on a nonelectronic rating -- Storekeeper. Results of the field tests are summarized.

The structured interview was found to be a highly satisfactory method of obtaining training feedback information and is recommended for use by Navy school personnel. The specific job analysis, sampling, interview, and data analysis techniques, upon which the structured interview procedure is based, are described, and examples of the data-gathering instruments are provided.

Training Feedback to the Navy Storekeeper Class "A" School. SRR 72-14, January 1972. C. R. Bilinski and J. C. Saylor. DDC Accession Number AD 737 224.

A job analysis yielded 196 task items judged to be necessary for performing most assignments normally given graduates of the Navy Class "A" Storekeeper School. Based upon the job analysis, a structured interview, check lists, and a card sort were used to obtain information from a fleet and shore sample of Storekeepers concerning their experiences in performing assigned tasks.

An Appendix contains detailed findings and specific recommendations for changes or modifications in the training courses provided SKs who will be assigned to either automated ships, non-automated ships, automated shore stations, or non-automated shore stations.

The most frequently occurring tasks included those involving storeroom practices and procedures, maintaining files, completing DD and NAVSUP forms, and use of a variety of lists and publications.

The tasks causing the most difficulty included those associated with returned material, unidentifiable material, erroneous shipments, the OPTAR Log, format requirements, priorities, and inventory preparation.

Basic Hand Tools Training for Group IV Personnel. SRR 72-19, March 1972. A. G. Archibald, R. J. Harrigan and E. A. Hooprich. DDC Accession Number AD 740 085.

As part of a larger program to determine which Navy skills can be learned by lower aptitude personnel and to ascertain what methods are most effective for accomplishing such training, an experimental course in basic hand tools was administered to 133 Mental Group IV students in 9 classes. Research data were obtained by means of questionnaires and both paper-and-pencil and performance tests. The major research findings were (1) that Group IVs demonstrated statistically significant gains in their ability to select and utilize a wide variety of hand tools commonly used in the Navy, (2) that the length of the daily training sessions did not affect hand tool training, nor did the size of the student-instructor ratio except when reduced to 4 or 5 to 1, and (3) that the Group IV trainees reacted favorably to the course content and the training methods, and they strongly prefer school courses and occupational activities which involve manual as opposed to academic skills. Conclusions regarding the training of Group IV personnel are presented.

Exploratory Application of NPTRL's Course Design Procedure to Redesign of the Amphibious Command Orientation Course: A Proposal for Implementation. SRR 72-16, March 1972. Charles M. West and Edward A. Rundquist. DDC Accession Number AD 740 084.

This research demonstrates that NPTRL's course design procedure (CDP) can be applied to redesign of a high level Navy officer training course. Contained in the report is a model for course organization, specification of example training tasks and methods of presentation, and enumeration of general developmental considerations. It is recommended that redesign of the Amphibious Command Orientation Course be continued following the model contained herein.

A Selective Review of Listening Research. STB 72-10, May 1972. N. H. Van Matre and J. H. Steinemann. DDC Accession Number AD 743 946.

This literature survey constitutes an initial research effort designed to identify those factors which appear to be critical in auditory comprehension and which may eventually be utilized in programs to enhance the listening abilities of Navy personnel. A review of recent research was needed to assess the new and changing concepts of listening which are now available. A broad survey of listening information sources was conducted, consisting mainly of an overview of the available research literature, correspondence and personal contacts with other research groups, and first-hand evaluation of existing listening programs, equipment, and tests. The findings from the literature were discussed under three topic areas including: (1) Elements of Listening, (2) Measurement of Listening, and (3) Relationships of Listening Ability to Other Variables.

Development of Two Models for Improvement of a Combat Information Center Watch Officer Course: A Proposal for Implementation. SRM 73-1, July 1972. John F. Brock. DDC Accession Number AD 747 291.

In connection with a study to train combat information center watch officers (CICWO's) in monitoring and evaluating, consistently poor student performance has been observed. Another problem in the same training course is the failure to test the student's meeting of course objectives. This report presents a model programmed instruction (PI)--called an operational PI--to help solve the first problem, and a model test to solve the second. Additionally, specific barriers to the implementation of a course design procedure are discussed.

students received the CAI treatment. The CAI students scored significantly higher than classroom controls on each of the three major performance tests (85 vs 80, 90 vs 78, and 85 vs 80). Total CAI training time was 15.7 hours and represented a 53.8% time savings over classroom instructional time. CAI lessons employing "skip ahead" and "minimal training" pretest branching designs provided the naive and slow learning student with 2 to 4 times more training than the sophisticated and fast learning student.

The Effect of Incentives on Student-Paced Instruction. STB 73-2, September 1972. Kirk A. Johnson, Phyllis A. Salop and Larry G. Harding. DDC Accession Number AD 753 205.

A system of incentives was developed for use in a student-paced training sequence. Student aptitude was used to predict each student's rate of progress through the sequence. Students were told that if they fell too far behind their predicted rate of progress, they would be assigned to special remedial study sessions, and that if they exceeded their predicted rate of progress, they would be given preferential treatment in assignments to subsequent courses. This system was evaluated in two studies on slightly different versions of the training sequence. In the first study the incentive system led to a 17% reduction in training time; in the second study it led to an 11% reduction in training time.

Evaluation of the Navy Basic Electricity and Electronics Course Individualized Learning System (BEEINLES). SRR 73-9, September 1972. J. H. Steinemann, J. D. Coady and J. C. Steadman.

This investigation was designed to evaluate the Basic Electricity and Electronics Individualized Learning System (BEEINLES) Course in terms of its training effectiveness and of its technical, operational and financial feasibility.

Application and Utilization of Training Aids and Devices: Simulated Exercises and Trainee Performance Evaluation. SRR 73-7, September 1972. David J. Chesler. DDC Accession Number AD 749 005.

This final report summarizes accomplishments and implications of the project for the development and implementation of Navy training devices that utilize computer-based simulation. The effective utilization of such devices is enhanced by a built-in capability to record and process trainee response data, so that gain in proficiency during the training period can be determined. The emphasis is on Navy anti-air warfare in the shore-based training environment, but the results are applicable to other training environments. The report also describes achievements in the areas of exercise design. The computer-based simulation facility utilized was the Tactical Advanced Combat Direction and Electronic Warfare (TACDEW) system at the Fleet Combat Direction Systems Training Center, San Diego. TACDEW is a computerized system for individual and team training for Combat Information Center, Command and Decision, Air Intercept Control, Electronic Warfare, Carrier Controlled Approach, and Air Tactical Data system. Both conventional and Navy Tactical Data Systems (NTDS) are represented. Accomplishments include: development of methodological procedures for exercise design and computer-assisted performance evaluation; a technique for real-time monitoring and encoding of voice net information for computerized performance evaluation; an experimental procedure for selecting performance variables for air intercept control. The methodological procedures are applicable to tactics evaluation and system effectiveness evaluation.

Applications of Pretest Branching Designs to CAI Basic Electronics Training. SRR 73-8, September 1972. Richard E. Hurlock. DDC Accession Number AD 750 684.

This report presents results of development and evaluation of a fourth computer assisted instruction (CAI) course module (Capacitance) for basic electronics and includes the investigation of two pretest branching strategy designs intended to adapt instruction to meet individual training needs. Descriptions included: (1) a new technique for coding lesson materials and student responses to facilitate and improve course revision, and (2) tryout and revision cycles made during the developmental phase. The test and evaluation phase compared achievement and time measures of students trained on the previously developed CAI Inductance Module and the new CAI Capacitance Module with control students who received regular classroom instruction over the same training objectives. Normal time scheduled for classroom instruction was 34 hours. A total of 64 randomly selected

The available evidence indicates that BEEINLES achieves its purported learning goals at least as effectively as the previous conventional BE/E Course. Additionally, BEEINLES has several inherent advantages in operational facility and in monetary savings which should prevail when INLES is appropriately applied to other training contexts. Despite demonstrable training benefits BEEINLES does not represent the ultimate realization of individualized training concepts. Specific aspects of the course warrant further development, evaluation, and refinement to insure their optimal utility.

Fixed Sequence and Multiple Branching Strategies in Computer Assisted Instruction. SRR 73-6, September 1972. Dewey A. Slough, Burl D. Ellis and George F. Lahey. DDC Accession Number AD 750 683.

An experimental comparison was made between fixed sequence (FS) and branching versions of two CAI lessons in basic electronics. The FS versions provided minimum opportunities for branching. In contrast, the branching versions utilized a combination of branching applications, including bypassing of initial instruction, remedial branching, "dual-control" practice, and optional review. Branching produced substantial savings in training time. Average times for the branching versions were 30% to 66% smaller than for the FS version. Branching was equally effective for students of high and low aptitude. Scatter plots and regression analysis indicated that average time savings were the same at all aptitude levels sampled. The number of branch frames taken was independent of aptitude. Branching increased the extent of individual differences in training time.

Computer Assisted Instruction in Navy Technical Training Using a Small Dedicated Computer System: Final Report. SRR 73-13, November 1972. John D. Ford, Jr., Dewey A. Slough and Richard E. Hurlock. DDC Accession Number AD 752 999.

This project investigated the feasibility of CAI for Navy technical training. The computer system used was the IBM 1500 system. The curriculum was taken from Basic Electricity/Electronics School. Five CAI modules were developed which could replace 92 hours of the class curriculum.

CAI provided very effective and efficient instruction. CAI students scored higher than class-instructed students on School Examinations as well as Supplemental tests, and required about 45% less training time. Student attitudes were quite favorable to CAI.

A complete CAI data management and course revision methodology was developed in this project. Revisions using this methodology resulted in marked improvements in instruction.

A number of new developments were made in branching technology for use in remediation, training, drill and practice, and review. Incorporation of these developments into CAI lessons was shown to produce substantial reductions in training time.

Although the CAI training was very effective, the 1500 system is not economically feasible for training in basic electronics because of the limitation of 32 terminals and its relatively high cost. Newer systems will be cost effective for such applications.

Preliminary Results on the Evaluation of a Fleet Post-Training Performance Evaluation Technique. WTR 73-10, January 1973. B. A. Rafacz & P. P. Foley. DDC Availability No. AD 755 171.

The purpose of this research is to validate the utility and effectiveness of a unique human performance measurement technique developed under ONR contract (Noool467C0107). Performance data on eight Navy ratings was collected from ships of LANTFLT and PACFLT. This report is the first in a series of technical reports on the statistical analysis of that data. In particular, a statistical analysis is provided on performance related data for electronic maintenance personnel sampled from 11 ships of CRUDESFLOT NINE, San Diego, California. Four different performance stimulators, as functions of critical incidents, are evaluated with respect to a performance criteria. A detailed explanation of the distributional properties of the performance estimators is presented and an explanation of the factors that lead to the adoption of a curvilinear regression analysis for analysis of the data are discussed.

The results of the statistical analysis indicated that a certain combination of the performance data possessed moderate validity for measuring the absolute level of technician performance. Detailed analysis of the performance data also identified the areas of difficulty that have to be avoided in order to improve upon the validity of each of the performance estimators. These and other preliminary results indicate that the technique possesses merit for further development and research. The Naval Personnel Research and Development Laboratory is continuing research on this technique with respect to the totality of data collected.

The Development and Statistical Evaluation of a Recruit Training Performance Test. SRM 73-4, March 1973. Charles H. Cory, Bernard Rimland, Edmund D. Thomas and James Hysham, CDR MSC USNR.

The Recruit Performance Test (RPT) was developed to meet a widely recognized need for an accurate measurement of achievement in learning the military/psychomotor skills in recruit training. It was hoped that the test would be of special value in assessing the achievement of Category IV personnel, who are thought to be penalized by the present emphasis upon verbal/academic testing. The RPT, composed of items in the recruit training curriculum which were the most amenable to performance testing, was administered to recruits in their fourth through tenth weeks of training. Despite intensive efforts to develop a wide variety of appropriate test items, the following deficiencies were found:

1. Most recruits were able to perform at a very high level, thus rendering the test too easy for effective discrimination.

2. Although inter-rater reliabilities for the test were acceptable, $K\text{-}R_{20}$ reliabilities were marginal and alternate form reliabilities were low.

These deficiencies would preclude the use of the RPT for comparisons among individual personnel; however, the test may prove to be useful as an index of performance differences between groups.

A Comparison of Student Option Versus Program Controlled CAI Training. SRR 73-17, April 1973. Patrick H. McCann, George F. Lahey and Richard E. Hurlock. DDC Accession Number AD 759 021.

The goals of this study were (1) to compare two instructional strategies for individualizing computer assisted instruction (CAI) training materials and (2) to evaluate the effect of providing a lesson narrative before training.

This development effort is a part of a program in which a number of CAI instructional strategies are being developed and tested for basic electronics training. Two types of adaptive instructional strategies were compared: (1) the student selected his own training and (2) the course program controlled training for the student based on his pretest results. The influence of having the student read a narrative overview of training content before CAI instruction on each lesson was also examined. The subject matter consisted of AC series circuits in the Basic Electricity/Electronics (BE/E) School, and the course materials vehicle was a modified version of the previously developed CAI "AC Series Circuits and Resonance Module."

No significant differences were found between the four experimental conditions in test performance or training time measures. Questionnaire data indicated that students who selected their own training maintained a significantly more favorable attitude toward CAI. In addition, students who had a pre-training narrative available to them felt that it was a valuable aid.

Post Lesson Remediation and Student Control of Branching in Computer Based Training. WTR 73-47, June 1973. B. A. Rafacz & P. P. Foley.

The purpose of this research effort is to validate the utility and effectiveness of a unique human performance measurement technique developed under ONR contract (N0001467C0107). Performance data on eight Navy ratings was collected from ships of LANTFLT and PACFLT. This report is the last in a series of technical reports on the statistical analysis of that data. A statistical analysis is provided on performance related data for electronic maintenance personnel sampled from 21 ships. Four different performance estimators, as functions of critical incidents, were evaluated. A detailed explanation of the distributional properties of the performance estimators is presented and an explanation of the factors that lead to the adoption of a curvilinear regression analysis for analysis of the data is discussed.

The results of the statistical analysis indicated that a certain combination of the performance data possessed moderate validity for appraising the absolute level of technician on-the-job performance in the EM, ET, FT and IC ratings. Application of the technique to technicians in the RM, ST, and TM ratings was tenuous, but still appropriate, while none of the performance estimators seemed to be applicable to technicians in the RD rating. For this reason it is suggested that the technique be employed in other ratings after a validation effort as was conducted in this report is accomplished. It has been observed that the technique possesses sufficient merit to be recommended for more widespread use within the U. S. Navy.

Comparison of Paired Students and Individual Students Trained by CAI. SRR 73-21, June 1973. Judith A. Hurlock and Richard E. Hurlock.

The feasibility of reducing cost per terminal hour of computer assisted instruction (CAI) was investigated by training Ss in pairs on two modules of an operationally tested tutorial CAI course in the Navy's basic electronics curriculum. Navy electronics students, randomly assigned to groups, received all training on an IBM 1500 Instructional System. No differences were found between Ss trained in pairs (N = 50) and Ss trained alone (N = 25) in performance on two major tests and a comprehensive examination or in training time. The paired training condition appears to have produced attitudes toward CAI that were significantly less positive than those produced in the control condition. The major complaint reported by paired students was that their partner went either too fast or too slow. There is need for additional research to investigate optimal methods for assigning partners and controlling attitudes for paired student training by CAI. In conclusion, the results of this research indicate that paired student training is a feasible method to reduce the cost per terminal hour of CAI, where CAI course materials are basically linear and where students are paired on the basis of learning rate and aptitude.

Description and Preliminary Training Evaluation of an ARC Welding Simulator. SRR 73-23, June 1973. Macy L. Abrams, William R. Safarjan and Robert G. Wells.

Training effectiveness of a prototype arc welding simulator was evaluated by comparing 13 naive welding students trained under conventional methods with 14 subjects trained under the following experimental procedure: quarter-time simulator practice, quarter-time awaiting use of the simulator, and half-time actual welding practice. Preliminary data indicated that the simulator trainees, with substantially less welding practice and combined welding/simulator practice, performed as well as the conventionally trained subjects. However, prior to determining with certainty whether the simulator is an effective training aid, it was concluded that additional experimentation is required controlling for differences in training-time. A description and physical evaluation of the apparatus is provided as well as an outline of its potential advantages.

The Effectiveness of Intercultural Relations Training for Vietnam Advisors. SRR 73-20, June 1973. Alan W. Lau and Ervin W. Curtis. DDC Accession Number AD 763 354.

The Intercultural Relations (ICR) - Vietnam (VN) program was designed to provide predeployment training to Navy personnel for duty in Vietnam. This interim report examines the degree to which the program was having desired effects.

A series of objective instruments were selected for measuring relevant attitudinal change. Baseline data were collected from trainees regarding skills in interpersonal relations, flexibility, leadership style, and level of self-actualization. This information was used as a reference in assessing skills after training. Tests were also administered to a control group and to a group tested only after training. Pretest and posttest difference scores were tested for statistical significance. It was hypothesized that training would have a greater impact upon attitude change than that in a comparable control group.

It was found that the experimental group increased significantly more than the control group on consideration (a style of leadership characterized by allowing subordinates more participation in decision making) and decreased significantly more on structure (a style of leadership characterized by goal attainment). Also, the experimental group changed more on flexibility (a measure of readiness to make changes in behavior)and needs for recognition. On a self-report questionnaire, the experimental group reported more positive change than the control group. It was concluded that training was partially effective in terms of what was regarded as critical attitudes required for unsuccessful on-the-job performance, and were compatible with behaviors outlined as requisites for in-country effectiveness.

Evaluation of Individualized Instruction for Welders - HT "A" School, San Diego. SRM 73-5, June 1973. William R. Safarjan and Macy L. Abrams.

The present study was a preliminary evaluation of an individualized training program for fuel gas and arc welding at Hull Technician Class "A" School, San Diego. Individualized instruction differed from former training procedures in that students were able to select the content, rate, and method most appropriate to their learning experience. Prior to this time, training had been conducted according to a lock-step method where students received 90 hours of formal instruction and practical application in each area.

Subjects were 184 trainees attending the school. One-half were trained according to the conventional lock-step method and the remaining 92 subjects received individualized instruction. Students within each category were further subdivided into those trained during day and night classes. Instruction in arc and gas welding was analyzed separately, and performance (a composite score on written and practical examinations) and time in training were the criterion measures used.

The following conclusions and recommendations were drawn from this evaluation: (1) The School's individualized welding instruction was markedly superior to the lock-step procedure. Time savings were substantial. (2) Differentiation in training time was found between day and night students within the experimental group. The general superiority of night students suggests that the individualized procedure is more sensitive to other variables, such as level of motivation or training environment, which have previously been found to influence learning. (3) Further evaluation should include separation of the performance measures into its written and practical components.

Interpretation and Training Uses of Computer Printout Data of Naval Occupational Task Analysis Program (NOTAP). WTR 73-34, June 1973. J. H. Swann.

This investigation is concerned with the interpretation of Navy Occupational Task Analysis Program (NOTAP) computer printout data in terms of its use in the design and development of Navy training programs, courses, and curricula.

The study interprets NOTAP data and shows how it may be used most effectively in the design and development of training programs to insure that the policy of the Chief of Naval Training is implemented, namely, "that all Navy training be based upon a thorough and meticulous analysis of the duties and tasks to be performed by the trainee, to the end that all Navy training is 'job-relevant.'"

Examples of a training program design and a format for a job/task analysis based curriculum is presented to illustrate how to specifically use NOTAP data for this purpose.

Recommendations are made that the procedures presented in the report be field tested and refined as standard procedures for the design and development of Navy training programs based upon NOTAP.

Relative Roles of Experience/Learning and Visual Factors on Radiographic Inspector Performance. SRR 73-22, June 1973. Robert C. Megling and Macy L. Abrams.

The purpose of this research was to determine the relative roles of experience/learning and selected visual aptitude factors on the ability to detect and identify indications of defects in X-ray film of welds and other materials.

Penetrameter Detection and Defect Identification Tests were developed to measure the ability of radiographic film inspectors to detect and identify weld defects. These tests and the Ortho-rater examination were given to Navy certified film inspectors. Test results and visual examination results were compared to determine the relationship between vision and film reading skills. Both film tests were readministered six months later to determine film inspector reliability.

No significant relationship was found to exist between the selected visual aptitude factors and film reading ability. Low levels of inter and intra-subject reliability were found to exist on both the detection and identification tests, and a significant intra-subject relationship was found between identification test reliability and experience. This suggests that learning plays an important role in the acquisition of film reading skills.

Based on the above findings it was recommended that research be conducted to determine optimum learning strategies in the dimensions underlying film reading skills and that the results from that research be used to develop a new radiographic inspector training program.

HUMAN FACTORS SUPPORT

Proficiency Tests for NTDS Maintenance Personnel: Computer Technician and System Technician - Final Technical Report. Personnel Research Report, July 1963. (W)

This report discusses the development of job proficiency tests for two maintenance billets: NTDS Computer Technician and NTDS System Technician.

Status Report - PC(H) - 1 and Mobile Support Group. Report No. ND 64-2(N), Personnel Research Note, July 1963, 7 pp.

This research note presents the current status of personnel and training for the PC(H) - 1 Hydrofoil patrol craft and its Mobile Support Group.

The Projected Effects of Electronic Developments on Navy Personnel Requirements During the Period 1965-1980. Report No. ND 64-12, Personnel Research Memorandum, August 1963, 33 pp.

A description of the projected electronic state of the art is presented along with a predicted schedule of electronic progress within the Navy. From this basic information are derived implications for work requirements, qualification requirements, the personnel classification structure, personnel assignment and career planning, selection, and training for officer and enlisted personnel.

Small Ship High Capacity Communications System: status report on. Report No. ND 64-3(N), Personnel Research Note, August 1963, 1 p.

The current status of the subject system and the difficulties experienced during evaluation are briefly discussed. Also included is the anticipated personnel research involvement during FY 1964.

Training Feedback Study Report on TARTAR Weapon System Personnel. Report No. ND 64-18, Personnel Memorandum, August 1963, 34 pp.

This report discusses the training received by TARTAR Weapon System personnel and offers suggestions for improving training procedures.

Training Feedback Study Report on TERRIER Weapon System Personnel. Report No. ND 64-17, Personnel Research Memorandum, August 1963, 31 pp.

This report presents the findings of a study conducted to determine the adequacy of training programs for TERRIER Weapon System Personnel. Several areas of training were identified as deficient. Recommendations include (1) more experience with equipment and (2) more system indoctrination.

Forecasting Electronic Maintenance Skills Levels for New Developments in the Navy. Report No. ND 64-26, Personnel Research Report, October 1963, 108 pp.

A research study providing a developed partial list of electronic maintenance tasks. The list is scaled by skill level. One of the scales uses a simple complex continuum. The other involves an estimate of the training time required to reach the necessary skill level.

TYPHON Pre-Training. Report No. ND 64-25(N), Personnel Research Note, November 1963, 7 pp.

This report identifies TYPHON Pre-Training course objectives, content, sequence of topics and time allotments.

Prerequisite Training Requirements for the Torpedo MK 46 Repair Course. PRASD Memorandum Report 63-17, December 1963. (Later issued by PRD as Report No. ND 64-44.) Irving E. Kaplan.

An analysis of the recommended Torpedo MK 46 Repair Course is made to determine the knowledges and skills required in preparation for this course. These knowledges and skills are then compared with material provided in available prerequisite courses, resulting in a list of prerequisite knowledges and skills not included in the existing prerequisite courses.

TERRIER Weapon Direction System Training Consolidation. PRASD Memorandum Report 63-16, December 1963. (Later issued by PRD as Report No. ND 64-46.) James A. Saxon.

This report discusses the feasibility of consolidation of training courses for the WDS MK's 1, 3, 5 and 7, the areas of overlap between courses, and the effect of such consolidation on personnel capability in the areas of maintenance and operation of equipment.

It was determined that consolidation is feasible because the existing courses are quite compatible in function, theory of operation, data flow and circuitry. The primary difference is in the number and types of consoles. There is no course for the WDS MK 1.

It was recommended that all personnel be trained on the MK 7 system (the most complex of the courses studied), followed by a two-week equipment oriented course. This would overcome any decrease in personnel effectiveness caused by not training on equipment used on board ship and it would have the additional advantage of making the technicians more versatile, knowledgeable and mobile.

Predicting the Corrective Maintenance Burden:

Volume XI, Prediction Procedure (Revised), January 1964. (W)
Volume XII, Evaluation of Prediction Procedure and Detailed Report on Application to the AN/SPS-28, January 1964. (W)

A Study that provides techniques and procedures for utilizing equipment design characteristics and reliability and maintainability data to predict, during the early phases of the development of new electronic systems, qualitative and quantitative personnel requirements for performing corrective maintenance.

Relation of Training to Job Requirements-TALOS Weapon Control System Technician. Report No. ND 64-47, Personnel Research Memorandum, January 1964, 24 pp.

The study develops a billet description for TALOS Weapon Control System Technicians, considers how knowledge of the total system is utilized and compares the CG and CLG systems courses for possible course consolidation.

TERRIER Weapon Direction Training Consolidation. Report No. ND 64-46, Personnel Research Memorandum, January 1964, 29 pp.

Course curricula for the WDS MK 1, 3, 5 and 7 were examined for the possibility of course consolidation. to determine areas of overlap and to determine the effect of such consolidation on personnel capability in the areas of maintenance and operation of the WDS equipment.

The Bureau of Naval Personnel New Developments Human Factors Program. Report No. ND 64-51, Personnel Research Report, February 1964, 178 pp.

This document integrates all personnel new developments human factors requirements and activities, the weapon system development cycle, the personnel subsystem (Personnel Program Management), and activities of the Bureau of Naval Personnel operating divisions into a comprehensive human factors program supporting new weapon and support systems and advanced personnel research technology. It describes the roles of all agencies and organizations as they relate to the program.

Prerequisite Training Requirements for the Torpedo MK 46 Repair Course. Report No. ND 64-44, Personnel Research Memorandum, February 1964, 12 pp.

This report compares the prerequisite knowledge requirements for the MK 46 Repair Course with the training content of the basic and advanced courses in undersea weapon circuits being given or planned at the Advanced Undersea Weapons School, Key West, and at the ASW School, San Diego.

Proficiency Tests for Missile Technicians Maintaining the AN/SKQ-1 Telemetering Ground Station Equipment.

Volume I	Test Forms	NAVPERS 93393-1, February 1964. For Official Use Only.
Volume II	Examiner's Manual	NAVPERS 93393-2, February 1964. For Official Use Only.
Volume III	Technical Report	Report No. ND 64-37, February 1964.

This proficiency test is designed to measure the performance of missile technicians in maintaining telemetry ground station equipment AN/SKQ-1. It is planned for use in evaluating the preparedness of all Class "C" graduates for fulfilling the requirements of their fleet jobs.

Proficiency Tests for Missile Technicians Maintaining the Telemetry Ground Station Equipment (AN/SKH-1 and AN/UKR-10). Report No. ND 64-36, Personnel Research Report, February 1964. For Official Use Only.

These proficiency tests are designed to measure the performance of missile technicians in maintaining telemetry ground station equipment (AN/SKH-1 and AN/UKR-10). These tests permit diagnostic appraisal of technician ability to detect chassis malfunctions during preventive maintenance tasks and provide a systematic step-by-step assessment of fault isolation and correction procedures.

Personnel Implications for NTDS Maintenance Support Activities. Report No. ND 64-48(N), Personnel Research Note, March 1964, 9 pp.

Research indicates that there is no requirement for placing DS personnel aboard tenders or at shipyards for purposes of performing overhaul on NTDS equipments.

Shipboard Training Program for the Data Processing Peripheral Equipment of the Interim Command Ship Data System. Report ND 64-39, Personnel Research Memorandum, April 1964, 52 pp.

Since replacement training for the Interim Command Ship Data System is expected to be accomplished on board ship, the Fleet requires complete and accurate training information. This report includes prerequisites which trainees should fulfill and the training objectives to be accomplished by on-the-job training.

Assigning Human Factors Requirements in the Test & Evaluation Stage of Systems Development. Report No. ND 64-68, Technical Report, June 1964. Volume I, 46 pp. Volume II, 55 pp.

Purposes of the research were four in number: To develop a methodology; to demonstrate its feasibility on two systems undergoing operational test and evaluation; to derive characteristics and a format for future test plans; and to uncover and clarify areas requiring further research. By virtue of close association with OPTEVFOR personnel, measures were derived which are of practical importance and at the same time are compatible with current and potential OPTEVFOR techniques. A plan was derived for relating human factors problems to decisions of whether or not System X will operate satisfactorily in the Fleet using normal personnel complements.

Selection and Prerequisite Training Requirements for the Torpedo EX-10 Turnaround Course. PRASD Memorandum Report No. 64-19, June 1964. Macy L. Abrams.

This report determines the selection and prerequisite knowledge, skill, and training requirements for the factory and Navy Torpedo EX-10 (MK 48) turnaround courses and ascertains whether the skills or knowledges are included in the current Torpedoman's Mate (TM) prerequisite course. The results of the research indicate that the Torpedo EX-10 Turnaround Course will not require as high selection qualifications (e.g., high cutting scores on the basic test battery) as required by contemporary torpedo turnaround courses or the current 240 hour prerequisite training course. A 50 hour proposed Prerequisite Training Course Outline for EX-10 TMs is presented in lieu of the 240 hour course.

The Bureau of Naval Personnel New Developments Human Factors Research Plan for SEAHAWK. Report No. ND 65-2, Personnel Research Memorandum, August 1964, 50 pp.

This report provides a prose and network description of all New Developments Research Program actions required for personnel and training research for SEAHAWK. The report is broken into separable sections, each covering a specific subsystem or set of subsystems: Propulsion, Integrated Combat System, and SONAR.

Torpedo MARK 37 Mod 0 and Mod 1 Training Feedback Study. Report No. ND 65-7(N), Personnel Research Note, September 1964, 8 pp.

This report presents results of a study designed to evaluate information derived from performance tests as well as opinions of supervisors in providing feedback information to training and fleet activities on the relative effectiveness of Class "C" graduates in maintaining the Torpedo MARK 37 MOD 0 and MOD 1.

The Projected Effects of Electronic Developments on Navy Personnel Requirements During the Period 1965-1980 (ND 64-12): A Critique of the Original Report and a Discussion of the Effects of Late Developments in Micro-Electronics on the Navy's Human Element. PRASD Memorandum Report No. 64-24, October 1964. (Later issued as PRD Report No. ND 65-20). Irving E. Kaplan.

Critical comments directed at a previous report, The Projected Effects of Electronic Developments on Navy Personnel Requirements During the Period 1965-1980 (ND 64-12), are presented and answered in addition to the direct replies to the comments, the answers contain discussions of the substantial progress in microelectronics made since the research for the original report was concluded. Findings include indications that the opinions of technical personnel, the commenters, and the writer were too conservative; revolutionary changes will occur in the requirements for electronic personnel; and that it may be feasible to replace the Navy's suit of conventional electronics with cheaper more reliable microelectronic systems. In addition it was recommended that the Bureau of Personnel establish a program of deep forecasting of long range personnel requirements based on analysis of new developments in science and technology.

The Bureau of Naval Personnel New Developments Personnel Planning Information Documentation Procedures and Formats. Report No. ND 65-10, Personnel Research Report, November 1964, 55 pp.

The purpose of this report is to assist New Developments analysts and contractors in documenting Personnel Planning Information (PPI) as required for the Bureau of Naval Personnel Research Reports.

Small Boat Manning Requirements for AUTEC. Report No. ND 65-14(N), Personnel Research Note, November 1964, 4 pp.

The purpose of this report is to recommend manning for the district craft, small boats and vessels assigned to the AUTEC project by OPNAV INST 9820.5J of 25 February 1963, and Advance Change 71 to this instruction.

BEST COPY AVAILABLE

AN/SRN-9 Navigation System Preliminary Personnel and Training Requirements. PRL Report No. ND 65-41, Washington, D. C., April 1965, 26 pp. E. P. Borkowski.

Describes the preliminary personnel and training requirements for personnel assigned to operate and maintain the AN/SRN-9 Navigation equipment.

AUTEC Weapons Range Training Study. PRL Report No. ND 65-47, Washington, D. C., May 1965, 11 pp. C. P. Adams.

Training recommendations for the AUTEC Weapons Range are provided.

Final Status Report on Critical Review of SEA HAWK Manning Subsystem. PRL Report No. ND 65-44, Washington, D. C., May 1965, 16 pp. R. J. Jackson, H. G. Himes and C. Gomberg.

Critically reviews the final status of the SEA HAWK Manning Subsystem. Evaluates the application of human factors methodology to system development.

Manning and Training Requirements for the U. S. Navy Space Surveillance System Field Stations. PRL Report No. ND 65-66, Washington, D. C., June 1965, 36 pp. E. P. Borkowski.

Proposes manning and training requirements for Navy personnel to be assigned to the Field Stations, U. S. Navy Space Surveillance System.

Manning and Training Requirements for the U. S. Navy Space Surveillance System Headquarters, Dahlgren, Virginia. PRL Report No. ND 65-64, Washington, D. C., June 1965, 72 pp. E. P. Borkowski.

Proposes manning and training requirements for Navy personnel to be assigned to Headquarters, U. S.Navy Space Surveillance System in the event of Navy manning at a future date.

Telemetry and AN/SKQ-1 Training Feedback Study. PRL Report No. ND 65-68, Washington, D. C., June 1965, 28 pp. L. R. Egan.

Describes the results of a training feedback study, using mailing procedures, which was conducted to derive data on the TLM AN/SKQ-1 Class "C" Course.

The Torpedo MK 46: Validation of Manning Recommendations and Early Training Feedback Information. SRM 65-7, June 1965. Irving E. Kaplan.

A nine day (3-11 May 1964) observation of the operation of the OPTEVFOR MK 46 torpedo shop is reported on and analyzed. The work environment, work process, manning, and technical proficiency are described. Observations and discussions are presented in verification of previous manning recommendations. Results published in a previous training feedback study were validated by observations of work proficiency. Additional conclusions and recommendations pertain to the use of a programmed audio tape for electronic test procedures; the role of overtraining in the preparation of OPTEVFOR personnel, Navy instructors initiating new courses, technicians initiating new repair programs; and the amount of work required to establish and maintain proficiency in torpedo technicians.

A Training Compatibility Study of the Naval Tactical Data System (NTDS), the Airborne Tactical Data System (ATDS), and the Marine Tactical Data System (MTDS). SRM 65-9, June 1965. Harold G. Smith and Hugh R. Rigney.

The NTDS, ATDS, and MTDS are tactical (anti-air warfare) data systems under use or development by U. S. military forces. Interview and questionnaire data were gathered and processed to establish estimates for the scope and content of potentially common training programs for the three systems. Findings are presented in terms of common training week estimates for the three systems in the areas of Tactical Data System Fundamentals, Maintenance Fundamentals, Operator Fundamentals, and Programing Fundamentals. Common training estimates are sufficiently large to support the common training hypothesis. Results of the study suggest that there might be an area for common training in all digital data systems now in use or under development within the U. S. Armed Forces.

A Preliminary Study of Man in the Sea Diver Personnel and Training Implications. PRL Report No. WRM 66-5, Washington, D. C., July 1965, 24 pp. A. S. Propst. DDC No. AD 621 627.

This report provides the Chief of Naval Operations, Bureau of Naval Personnel, Special Projects Office, Fleet Commanders, and Naval schools with preliminary information related to the diver personnel and training requirements for the Man-in-the Sea Program, and was prepared at the request of Pers-A41 (Personnel Program Management Division).

This research memorandum discusses projected diver requirements in the Navy and includes a review of existing and anticipated skills and knowledges, depth qualifications, equipment knowledge required, personnel selection prerequisites, hazardous duty implications, NEC and diving pay considerations, types of underwater tasks performed, and new technical skills required.

Comparison of existing versus projected diver personnel and training requirements are discussed and reviewed in light of requirements envisioned for an on-going man-in-the-sea effort within the Navy.

Survey of Shipboard Naval Tactical Data System Training. SRM 66-5, August 1965. Harold G. Smith and Harold D. Chambers, PN1, USN. DDC Availability Number, AD-469 289.

From February 1965 through April 1965, officers and enlisted personnel aboard six Naval Tactical Data System (NTDS) equipped ships completed questionnaires/interviews dealing with shipboard NTDS training programs.

The main findings of the study were that: (1) each NTDS ship has a nonstandardized training program oriented primarily to the specific needs of each ship, (2) shipboard NTDS training is necessary for transition between formal school training and the "real life" NTDS setting, (3) operator and maintenance personnel expressed desire for more background training in the NTDS system and theory, and (4) operator personnel would like more tracking skills, preferably with live targets.

Recommendations based on the findings of the study were that a more detailed study of shipboard NTDS training requirements be conducted to determine the feasibility of developing a more standardized shipboard NTDS training program and that if feasible the course content, training aids, etc., needed for such a program be developed.

Staffing Requirements for the Data Processing Center of AUTEC. PRL Report No. WRM 66-12, Washington, D. C., October 1965, 9 pp. J. P. Henry. DDC No. AD 472 868.

For purposes of this memorandum, it is assumed that AUTEC will be manned, at least in part, by military personnel and that the staff of the DATA Processing Center will be responsible only for certain aspects of range operation and data collection. It is further anticipated that the contractor will provide a computer repairman. The memorandum, therefore, recommends that MA's be assigned as operators and DS's (NEC 1631) as peripheral equipment repairmen.

Personnel Requirements of the AUTEC Acoustic and Sonar Calibration Ranges. PRL Report No. WRM 66-3, Washington, D. C., December 1965, 7 pp. J. P. Henry. DDC No. AD 474 720.

At present, it is uncertain what particular equipment will be installed at the Sonar Calibration and Acoustic Ranges of AUTEC.

However, the facilities of the Acoustic Range will require the services of technicians whose training and capabilities are similar to those of Oceanographic Specialists (ST-0411) and Project Caesar Maintenance Technicians (ET-1525). In addition, this report recommends that technicians trained to operate and maintain the most complex sonars presently used in the Navy be assigned to the Sonar Calibration Range to calibrate systems under test and to evaluate their performance.

System Analysis of the UHF Telemetering System. PRL Report No. WRM 66-18, Washington, D. C., December 1965, 35 pp. W. R. Murphy. DDC No. AD 474 727 L.

The purpose of this memorandum was to make a system analysis of the Missile Flight Evaluation System (UHF Telemetry), that is to replace the VHF Telemetry by 1 January 1970. The comparison of the UHF vis-a-vis VHF systems indicated some differences in their operation and maintenance. Present plans for equipment to be used on the UHF channels include modular construction, micro-miniaturization, solid state circuitry and display and plotting equipment. If these changes and improvements are achieved, the training for UHF telemetry will have to be a modification of the present training.

Torpedo Mark 46 Mod 1 and O: Torpedo Repair Officer Training Requirements. SRM 66-16, February 1966. Macy L. Abrams and Raymond E. Dietz, LT, USN. DDC Availability Number, AD-477 708.

This report presents information concerning personnel and training requirements for officers responsible for turnaround (maintenance) of the Torpedo MK 46 Mods 1 and 0 and maintenance of the associated support and special test equipment; specifically, Torpedo Repair Officers stationed aboard ADs, AVs, CVSs, ASW facilities and AUW shops.

Major findings include: (1) Torpedo Repair Officers will require both administrative and specialized technical knowledges and abilities to perform the duties and responsibilities required to assure reliable and efficient turnaround of the highly sophisticated electronic Torpedo MK 46 and maintenance of the associated special test equipment; and (2) adequate supervision of the turnaround of the Torpedo MK 46 can best be insured by assigning ordnance limited duty officers (LDOs 615X) or underwater ordnance warrant officers (WOx 733X) to the Torpedo Repair Officer billet and providing these officers with the 40 hours of training outlined in Appendix A of the report. (If other officer categories are utilized in this billet, up to 34 weeks of Torpedo MK 46 training will be required.)

Torpedo MK 44 Mod 1 Training Feedback Study. PRL Report No. WRR 66-6, Washington, D. C., April 1966, 79 pp. J. A. Gandy. DDC No. AD 481 251 L.

The report provided Navy training officials with feedback data from the fleet for evaluating Torpedo MK 44 Class C maintenance training. Related purposes were to conduct research on various feedback instruments and to obtain methodological data for improving the quality of training feedback. It was found that Class C training is highly effective in most respects. A few areas of weakness were noted. On-the-job training programs were found lacking in providing immediate applicable experience for Class C graduates. It was concluded that selected areas of Class C training could be improved. Recommendations were made that these areas be reviewed with reference to time and emphasis spent upon them. It was also recommended that a study be made of ways to improve on-the-job training.

With reference to the secondary purposes it was found that (a) personnel rate themselves on specific aspects of their jobs at least as well as their supervisors and (b) interviews, ratings, and proficiency tests each provide separate and valuable information concerning level of experience and proficiency of personnel.

Comparative Analysis of Service-Test and Production Models of the AN/SPS-49 Radar Systems. PRL Report No. WRM 66-53, Washington, D. C., June 1966. J. A. Webb. DDC No. AD 484 560 L.

This is the fifth personnel research report dealing with the personnel and training requirements of the AN/SPS-49/50 radar systems. It provides data concerning differences between the experimental service-test model and the production model of the AN/SPS-49 radar set developed via interviews and conferences with engineering and management personnel. This data will be used in the development of shipboard maintenance technician training for Electronics Technician (ET) personnel by the Bureau of Naval Personnel.

Manning and Training Requirements for an Intermediate Communications System Utilizing a VHF Transceiver. PRL Report No. WRM 66-42, Washington, D. C., June 1966. E. Zborofsky. DDC No. AD 483 654 L.

The purpose of this study was to determine the manning and training requirements for a communications system utilizing the AN/VRC-46 Radio Set. Current Army and Marine Corps training was analyzed to determine the impact on BuPers training with the introduction of this equipment into the fleet.

Manning Requirements for Fire Control Systems Associated with Torpedo MK 48. PRL Report No. WRM 66-49, Washington, D. C., June 1966, 15 pp. J. S. Carra & J. P. Henry. DDC No. AD 634 350.

This memorandum presents estimates of the manning requirements for fire control systems associated with Torpedo MK 48. No increase of billets is required for ships whose fire control system will undergo modification.

Officers assigned to the modified fire control systems will receive one week's instruction. Technicians will receive approximately eight week's training in the maintenance of the new components.

A Preliminary Study of Personnel and Training Requirements for Deep Submergence Rescue Vehicle (DSRV). PRL Report No. WRM 66-63, Washington, D.C., June 1966, 101 pp. A. S. Propst, Jr. DDC No. AD 636 521.

This report presents personnel and training implications incident to the development of a new and improved submarine rescue capability in the Navy. Included is a description of system design and support requirements. Estimates of personnel and training requirements for manning this system are based on current information and planning data and encompass the manned Deep Submergence Rescue Vehicles (DSRV), specialized support equipment, and support ships (one modified ASR; two new ASRs; and forty "mother" submarines - SS(N)s).

A Training Feedback Study of the Fire Control System MK 113 Mod 5. PRL Report No. WRM 66-58, Washington, D. C., June 1966, 17 pp. G. E. Mierke.

The purpose of this study was to investigate the adequacy of training that is provided to Fire Control Technicians for maintaining the Fire Control System MK 113 Mod 5.

All FTs with FCS MK 113-5 shipboard maintenance experience with an NEC of 1174 were surveyed by questionnaire for their opinions regarding the adequacy of coverage provided by the FCS MK 113-5 Class "C" School.

The returns indicate that several curriculum areas would benefit from an increase in emphasis, while two areas were considered to have been given somewhat more emphasis than may be required for fleet maintenance duties.

The Projected Effect of Automation on Future Navy Personnel Requirements. Part I: Specific Implications for the Personnel Structure. SRM 67-3, August 1966. Irving E. Kaplan. DDC Availability Number, AD-638 721.

Part I presents implications of industrial and naval automation for the Navy's human element. Consideration is given to the imminent possibility that the Navy will be required to provide a place for many personnel who cannot find employment in civilian industry, and discussion is also provided on the latter problem of the automated society as a source of naval manpower. The qualitative personnel requirements of a "fully" automated Navy are discussed and the manpower requirements of such a Navy are estimated in tabular form. A projected schedule for the advent of naval automation is omitted as the variables involved are too difficult to predict with any acceptable degree of validity.

The Projected Effect of Automation of Future Navy Personnel Requirements: Part II: Implications for the Navy's Environment, The Nation. SRM 67-3, August 1966. Irving E. Kaplan. DDC Availability Number, AD-638 720.

The single technological contribution which will have the greatest effect on the contemporary civilization is the microelectronic revolution. Microelectronic techniques will result in electronic systems and equipments which will be much smaller, will use less power, will be extremely reliable and maintainable, will be producible by automated methods and will therefore be very inexpensive. The potentially great reliability and very low cost of microelectronic circuitry will lower the costs of commercial and industrial computers to a point at which industry will find it competitively necessary to automate. Since any process which can be systematized, however loosely, is subject to cybernetic control and since the pressure of competition will force industry to do so, it is anticipated that most of industry will be automated within a short time. A time frame for the industrial changeover to automation is presented. The broad implications of automation for industry, the economy, the individual, the culture, and education as they will affect the Navy are discussed.

Landing Force Support Ship (LFS) Concept Formulation: A Preliminary Manpower Demand Study and its Relation to Human Factors Planning and Coordination in Ship Concept Formulation. PRL Report No. WRM 67-6, Washington, D. C., September 1966, 72 pp. A. W. Peters, S. Laverson and G. S. Malecki. DDC Nos. AD 800 955L and AD 376 682L.

NAVSHIPS has been designated as the Principal Development Activity for Concept Formulation, as defined by DOD Directive 3200.9. In support of the NAVSHIPS effort, the Personnel Research Laboratory, Naval Personnel Program Support Activity has been directed by the Bureau of Naval Personnel (BUPERS) to initiate human factors research in Concept Formulation.

This report describes the human factors research effort in Concept Formulation within a generalized conceptual framework, and then as applied to a specific LFS ship system. Within the parameters of Concept Formulation, it: (1) identifies Concept Formulation human factors research needs and objectives; (2) establishes a conceptual manpower analysis model, and details implementation processes based primarily upon official Navy documentation and current operational usage; (3) describes a pattern for the exchange of information among related programs; and (4) makes recommendations to meet immediate and future human factors research requirements.

Validation of Early Torpedo MK 46 Mod 1 Manning and Training Recommendations. SRM 67-6, September 1966. Macy L. Abrams.

Based upon the Navy's initial experiences in the use and turnaround of the Torpedo MK 46 Mod 1 (MK 46), the Technical and OPTEVFOR evaluations of the weapon, this report presents an initial validation of early MK 46 manning and training recommendations. Additionally, the report evaluates the factory MK 46 turnaround course. Major findings include:

1. An analysis of manning, work flow, and required work time and manpower during the operational evaluations supported previously predicted manning requirements (2) of five TMs per turnaround line. Specifically, two two-man work teams (one TM1 and one TMSN; one TM2 and one TM3) plus a TMC supervisor/technician will require an average of 23.5 man hours over 5.6 elapsed hours to turnaround the MK 46.

2. Observations of turnaround and discussions with the TMs and other knowledgeable personnel generally substantiated previous training recommendations (1 and 2) and indicated that the factory course was satisfactory. TMs will require either the BUWC or an equivalent prerequisite course plus approximately 480 hours of Class "C" training to turnaround the torpedo and maintain the test sets according to the current maintenance philosophy.

3. Under the present maintenance philosophy, depot level activities perform deep maintenance to the torpedo spares and special test equipment. However, some sources feel that turnaround shops should perform deep maintenance of the test equipment. To accomplish this, personnel would probably require the following additional training: (1) an expanded AUWC course containing six to eight weeks on solid state and digital circuits; (2) from eight to sixteen weeks of Class "C" School training on the test sets; and (3) provision for continuing on-the-job training (experience) in troubleshooting the test sets upon completion of the Class "C" School.

HUMAN FACTORS SUPPORT

Preliminary Analysis of the Lightweight 175mm/60 Caliber Gun Mount MK 1 Mod 0. PRL Report No. WRM 67-16, Washington, D. C., November 1966, 19 pp. F. Curhan. DDC No. AD 377 723L.

> This memorandum reports a preliminary analysis of the Lightweight 175 mm/60 Caliber Gun Mount MK 1 Mod 0. This mount exemplifies some of the technical advances currently being incorporated into gun design and development, e.g., lightweight construction; solid-state components; plug-in replacement personnel; two-piece barrel construction; automatic ammunition selection.

Impact of the MK 50 Series Mines Upon the Mineman Rating. PRL Report No. WRM 67-28, Washington, D. C., December 1966, 33 pp. D. F. Hinson. DDC No. not available.

> The purpose of this study was to analyze the resources of the Mineman Rating in terms of total numbers, aptitude, distribution, re-enlistment, and degree of training. These resources were then compared to the personnel requirements of the MK 50 series mines. It was found that the Mineman Rating is well staffed; however, the distribution of minemen personnel is such as to reduce the effectiveness of the rating. It was concluded that the training requirements imposed by the MK 50 series mines are not being met due to inadequate numbers of minemen attending minemen Class "B" School. Several recommendations were made in an attempt to rectify this situation.

Feasibility of a Personnel Requirements Information System Methodology (PRISM): Preliminary Phase I Report. SRM 67-14, January 1967. Harold G. Smith. DDC Availability Number, AD-810 585.

> The memorandum establishes the need and concept for a Personnel Requirements Information Methodology (PRISM) within the United States Navy. The objective of PRISM research is to develop a computerized human factors data program, weapon system oriented, that will provide for the accumulation and use of compatible personnel and training requirements information throughout the development cycle of new Navy hardware systems. PRISM data will also support functions allocations and man-machine trade-off decisions.

A Review of Air Cushion Ships and Craft as They Relate to the Navy Manpower Pool. PRL Report No. WRM 67-30, Washington, D. C., February 1967, 39 pp. G. N. Graine. DDC No. AD 813 099L.

Air Cushion Vehicles (ACV), in this paper, refers to the entire field of vehicle-types that employ a power-generated cushion of air for lift support, reduction of resistance and reduction of rough-water loads and motions. The Navy has a continuing interest in ACVs because some of these vehicles have demonstrated an ability to maintain high speeds in rough seas without completely uneconomical lift powers required to raise the vehicle.

Human factors considerations for ACVs are studied in terms of general training and manning requirements, and display and control systems. Skill and knowledge requirements for operation and maintenance of these vehicles does not appear to be beyond the present skills and abilities of naval personnel in the existing Navy rating struction; however, introduction of these vehicles into the Navy on an operational basis may require a revision of current personnel policies and procedures concerning the selection, training, and assignment of personnel.

Evaluation of Training on the Torpedo MK 46 Special Test Equipment. SRR 67-17, June 1967. Macy L. Abrams and Ray W. Alderman, ETCM, USN. DDC Availability Number, AD-818 750L.

This report identifies the Fleet Torpedo Shop Torpedo MK 46 Special Test Equipment (STE) maintenance job requirements and describes an evaluation of the adequacy of the prerequisite and Class "C" STE training given the STE Torpedoman's Mate, TM NEC 0747, with respect to meeting these job requirements. Evaluation instruments designed for this study included a comprehensive performance test, a written troubleshooting test, rating scales, interviews, and proficiency rankings. Subjects included the total population of STE graduates (TMs NEC 0747) in all operational torpedo turnaround (maintenance) shops during the study.

The results of the evaluation indicated that, based on the actual Fleet Torpedo Shop Torpedo MK 46 STE maintenance requirements current STE training is inadequate. STE Torpedoman's Mates require more training on: (1) circuit tracing and understanding of solid state circuit operations; (2) proper usage of the 18 standard test instruments used in STE maintenance, the training to emphasize the knowledges and skills attendant to, and practical experience on, instrument front panel operation; and (3) analysis of the 13 individual STE's circuitry and extensive practical experience in performing the STE maintenance procedures.

Personnel Implications of New Technological Development. Microelectronics and Automation. SRM 67-29, June 1967. David A. Wilson. DDC Availability Number, AD-656 452.

The purpose of this exploratory investigation is to develop and employ valid bases in forecasting the most likely effects of new technology on future Navy personnel and training requirements. This report emphasizes long-range personnel implications of the introduction of microelectronics and attendant automation into the Fleet. The research is not directed at developing a personnel plan, but at providing the Navy with a tool of long range personnel planning.

Content is based on a review of evidence previously developed, interviews with numerous scientists, technicians, and planners, both in and out of the military establishment, and a study of representative current technical and policy documentation.

This report forecasts that the initial introduction of "first generation" microelectronic equipment will temporarily increase the variety of spares in the logistics pipeline and impose additional training requirements on those technicians responsible for its maintenance. It is further predicted that large-scale integration of microelectronic circuits will supersede "first-generation" microcircuitry during the mid 1970s, which will result in the gradual elimination of traditional shipboard troubleshooting and repair of electronic equipments entering the development cycle during the late 1970s. Through gradual realization of very high inherent reliability, large scale circuit integration, and automated self-testing, substantial reductions in the logistics support requirements, and the numbers, skill levels, and training requirements of electronics technicians are forecast for the late 1970s and early 1980s.

This report recommends continuing long-range research as a basis for personnel planning designed to exploit potential benefits and to minimize adverse turbulence within the Navy.

Preliminary Manning and Training Requirements for the Automatic Test System (ATS). SRM 67-24, June 1967. Gordon S. Hulegaard.

This report presents a projection of preliminary manning and training requirements for the Automatic Test System, a computerized test and monitoring system to be integrated with shipboard electronic suites.

Performance monitoring and fault isolation testing from a centralized control console are new concepts in electronics maintenance and will influence the training, assignment, and utilization of electronics maintenance personnel.

An Analysis of Fire Control System MK 113 Mod 5 Maintenance Training. WSS 68-21, August 1967, Washington, D. C., 13 pp. G. E. Mierke.

An analysis of the training that is received by FT's for maintaining the Fire Control System MK 113 Mod 5 was conducted by reviewing curriculum data and equipment malfunction data.

Recommendations were made for shifts in emphasis for various curriculum areas as well as additional material to be included in the course.

Naval Officer Requirements for the U. S. Navy Space Surveillance System Headquarters, Dahlgren, Virginia. WRM 68-2, August 1967, Washington, D. C., 91 pp. E. P. Borkowski. DDC Availability No. AD 820 858.

Contained in this report are the quantitative and qualitative naval officer manning for the U. S. Navy Space Surveillance System Headquarters, Dahlgren, Virginia. It contains in detail the professional requirements for the billets as related to education, experience, and social knowledge.

A Preliminary Report on Training and Manning Problems and Implications for the FAST AUTOMATIC SHUTTLE TRANSFER (FAST) System. WSS 68-1, August 1967, Washington, D. C., 12 pp. J. A. Webb & W. R. Schoen.

This staff study was prepared at the request of the Chief of Naval Personnel to investigate the manning and training requirements of the FAST System. On-site research was conducted aboard fleet units and training sites, utilizing equipment comparison system analysis, and OSD. The report identified major problem areas with the Underway Replenishment function and their causative factors and their implications.

Personnel and Training Implications for the AN/UQN-4 Sound Set Sonar. WSS 68-6, September 1967, Washington, D. C., 12 pp. H. L. McLinden.

Short-range staff study that encompasses the following for the AN/UQN-4: brief functional description of system; manning and requirements for operation and maintenance; maintenance philosophy; and training requirements.

The information in this staff study is intended to provide Navy planners with basic information required for the conduct of training conferences.

Application of Automatic Data Processing Techniques to Task Analysis Diagramming. SRM 68-8, October 1967. David A. Wilson. DDC Availability Number, AD-660 002.

The purpose of this exploratory project is to develop automatic data processing (ADP) techniques applicable to the construction and revision of task analysis diagrams during final development of a new system.

This report presents a procedural guide to a simple experimental method of using automatic data processing in the production and revision of task analysis diagrams. Such techniques will be of benefit to both in-service and contract analysts in quickly and economically producing and revising such diagrams, as changes in system and hardware design are considered and incorporated into production-configured equipment. The resulting documents will provide a common informational tool to a variety of users in their effort to optimize the preparation and performance of the operator and technician. To avoid the necessity of security classification, the examples in this report are hypothetical, although they describe familiar types of equipment and procedures. A validation field test of this method, applied to an actual system under development, is planned for Fiscal Year 1968.

Feasibility of the Development and Utilization of Personnel Performance Effectiveness Measures for Man/Machine Function Allocation Decisions. SRM 68-7, October 1967. Joe E. Willis, Ph.D. DDC Availability Number, AD-660 003.

This report summarizes research undertaken to examine the feasibility of developing a methodology for providing quantitative indices of Personnel Performance Effectiveness (PPE), for use in man/machine function allocation decisions. Such PPE indices would also provide a personnel input to the general systems effectiveness model. After reviewing some of the most significant work which has been done by others in the PPE area, the general approach to be taken in developing a Navy PPE system is described.

Feasibility of a Personnel Requirements Information System Methodology (PRISM), Final Phase I Report. SRM 68-10, November 1967. Gordon M. Campbell. DDC Availability Number, AD-833 792.

This report details the preliminary feasibility report published in January 1967. The original PRISM design concepts are reviewed and expanded. Users of human factors information are described in relationship to each other and to human factors research. Types of human factors information are identified, related to each other and to the system development cycle. Relationships between PRISM and other BUPERS Navy information systems are identified.

Training and Manning Problems Definition for Underway Replenishment at Sea (UNREP). WSS 68-19, December 1967, Washington, D. C., 20 pp. J. Fedorko & W. Schoen.

This staff study describes briefly the various methods of replenishment at sea; identifies problem areas in providing training and maintenance support for equipments within the cognizance of the Underway Replenishment Project Office (PMS-90); and recommends a number of methods by which certain problems may be resolved.

Manning and Training Requirements (UNREP) Project. WRM 68-24, March 1968, Washington, D. C., 22 pp. J. Fedorko.

This study was conducted to define maintenance and training concepts, to identify new knowledge and skill requirements, and to develop recommendations for qualitative and quantitative personnel manning and training requirements to support UNREP and IRR equipments.

Recommendations of this study have been derived from analysis of available description, conferences with management and technical personnel, on-site observation and interviews with operating personnel.

This study defines training concepts, identifies basic knowledge and skills and recommends establishing quantitative and qualitative billet requirements, identified by NEC.

A Standardized Task Format for Personnel Requirements Information System Methodology (PRISM): Preliminary Report. SRM 68-17, March 1968. Gordon M. Campbell. DDC Availability Number, AD-666-978.

This report documents the development of a standardized task format designed to include all of the detailed information necessary for the development, analysis, and utilization of complete Navy personnel manning and training requirements information. An information structure developed at the Aerospace Medical Research Laboratories (AMRL) was utilized as a focal point for this phase of research. The AMRL task format was modified to make it more responsive to Navy requirements.

Preliminary Study of Personnel and Training Requirements for the Deep Dive System, MK 1 and MK 2. WRR 68-15, May 1968, Washington, D. C., 76 pp. K. H. Purdy. DDC Availability No. AD 833 903L.

This report provides preliminary information related to diver personnel and training requirements for the Deep Dive Systems, MK 1 and MK 2.

Discussed are personnel requirements for manning the Deep Dive Systems, including prerequisites, anticipated skills and knowledges, and the two types of planned training: interim and future.

Equipments are described, relating functions, operation and installations.

Training goals are considered, with detailed outlines of equipment training, including a training description narrative and section-topic outline.

Manning and Training Requirements of Navy ADP Systems, Phase II, ADP Skills and Knowledges: A Synthesis. WRM 68-21, June 1968, Washington, D. C., 414 pp. H. S. Cain, J. I. Bershtein & W. R. Carraway. DDC Availability No. AD 673 887.

The purpose of this research was to identify those skills and knowledges needed to program, operate and maintain the Navy's Automatic Data Processing (ADP) systems. The skills and knowledges identified for an individual system are then compared with other items in their respective programmer, operator and maintenance areas to determine items common to several systems and those items unique to a given system.

Two types of lists for the programmer, operator and maintenance areas are presented in this report - specific lists and general lists. The specific lists contain skills and knowledges needed to man a given ADP system (i.e., IBM 360, UNI 1500). The general lists contain skills and knowledges common to two or more ADP systems and those unique to a given system.

The findings of this study indicate that there are many areas of commonality among the various ADP systems studies, particularly among the non-tactical systems. It is concluded that commonalities are chiefly in the concept area. Unique skills and knowledges are dictated by differences in hardware, software, terminology and the applications performed by the various equipments.

Personnel Implications of the Centralized Automatic Test System (CATS) Mod O. SRM 68-27, June 1968. Gordon Hulegaard.

This report presents the personnel implications of the Centralized Automatic Test System (CATS) Mod O.

Preliminary Staffing and Training Requirements for CHAFFROC Decoy Systems. WRM 68-22, June 1968, Washington, D. C., 117 pp. T. G. Gentel. For Official Use Only.

This personnel research study was conducted to determine preliminary analysis of manning and training requirements for CHAFFROC System. The Shipboard Chaff Decoy System (CHAFFROC) is designed to place decoy targets in the sky to foil radar homing systems in missiles. A ZUNI Rocket carries a chaff-filled head to a pre-determined position in the sky where the chaff will bloom into a cloud and present a stronger target than the ship to the incoming missile guidance system.

Studies utilizing the operational audit technique were made of initial shipboard installations and related to manning requirements for operations and maintenance. Both formal and on-the-job training are discussed as well as the need for certain training aids, initial estimates of personnel and training implications which support both the system description and crew duties.

Several recommendations were made that would improve the prototype systems both in safety and operations.

A Procedural Guide to an Automatic Data Processing Method of Task Analysis Diagramming. SRM 69-3, August 1968. David A. Wilson. DDC Availability Number AD-677 794.

This report is an instructional manual containing detailed guidance to personnel analysts in producing and updating task analysis diagrams by a new ADP method developed in 1967 and reported in SRM 68-8. The diagrams may be used by personnel responsible for system design, equipment design, work design, the determination of manning and training requirements, and the preparation of training curricula and materials, maintenance manuals, training aids (including films), and job aids.

Preliminary Data Elements for New Systems Personnel Requirements Data System (NSPRDS). SRM 69-6, September 1968. Gordon M. Campbell and Robert C. Megling. DDC Availability Number, AD-678 890.

The purpose of this report is to document the developmental status of preliminary task data elements as specific components of a standardized human factors task structure for use during the development cycle of Navy weapon and support systems. Thirty-seven basic data elements previously identified as applicable to Navy human factors research were revised for increased adequacy, accuracy and utility. The initial Work Verb element was detailed in a comprehensive hierarchical taxonomy of mutually exclusive terms. These terms were arranged categorically by level of abstraction so that each category is mutually exclusive, thereby reducing the possibility for subsequent misinterpretation of meaning.

Interim Study of the New Submarine Sonar/Fire Control System Training Facility Requirements. SRM 69-5, October 1968. Vernon M. Malec. DDC Availability Number, AD-843 673L.

This report presents a synoptic description of projected NSS/FCS training facility requirements emphasizing personnel training considerations as they relate to a NSS/FCS trainer development program.

Impact of Automatic Data Processing Systems on Navy Personnel and Training Requirements, S32-10X. SRM 69-13, December 1968. William J. Stinson. DDC Availability Number, AD-848 586L.

This report presents updated information concerning the personnel and training implications of past and projected automatic data processing system (ADPS) developments. The operation of computers and associated peripheral equipment is relatively simple and may be readily learned by personnel in various ratings. Knowledge of specialty field subject matter is advantageous in the development of optimum related computer programs. Personnel in various ratings should be permitted to participate in applicable programming and systems analysis training courses. The creation of new Special Series NECs for the identification of qualified ADP operators, programmers, and systems analysts in various ratings would seem to be justified at this time.

Preliminary Staffing and Training Requirements for Second Generation CHAFFROC Systems. WRM 69-16, March 1969. T. G. Gentel. DDC Availability No. AD 850 794L.

This report contains a system description and tentative staffing and training requirements for the second generation CHAFFROC systems.

A Review of ASROC Magazine-Fed Direct Loader Personnel Implications. SRM 69-15, March 1969. Gordon Hulegaard and FTCS W. J. Schneider, USN. DDC Availability Number, AD-852 068L.

This report presents a review of the ASROC direct loader system, necessitated by changes in the systems, projected installation schedules and projected operational schedules.

AN/ASQ-8 and AN/ASQ-10 MAD Operator Task Description. SRM 69-19, April 1969. Walter F. Thode. DDC Availability Number, AD-851 318L.

In order to aid in training course revision and in proficiency improvement of Navy ASW Sensor Operators it is necessary to have complete task descriptions of the operators' jobs. A task description of the MAD operator's job is necessary as a first step in MAD operator proficiency improvement programs.

Attendees at ASW training conferences and Fleet training personnel have reviewed this task description. It is considered accurate, and it is expected that MAD operators will not be able to carry out their jobs adequately unless they perform all components listed here. All operator training courses and proficiency tests include all topics listed in this task description.

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Technical Supplement to Evaluation of Torpedo MK 46 Intermediate Level Maintenance Training. SRR 69-26A, April 1969, Macy L. Abrams and David D. Eskew, TMCS, USN.

This report describes an evaluation of the adequacy of the prerequisite and Class "C" turnaround (maintenance) training given the Torpedo MK 46 Mods 0 and 1 Torpedoman's Mate, TM NEC 0746 and/or 0747. The evaluation included 111 subjects who comprised nearly the total population of Torpedo MK 46 graduates assigned to operational torpedo turnaround shops in the United States at the time of the study. The shops included installations aboard ADs, CVSs, and shore stations, and a technically qualified examining team personnally administered, on site, all evaluation vehicles. Evaluation instruments designed for the study included a comprehensive performance test, a written troubleshooting test, rating scales, interviews, and proficiency rankings.

The results of the evaluation indicated that: (1) the present Torpedo MK 46 turnaround training is basically sound; (2) the two-week, rather than the 12-week AUWC, course should be used as the prerequisite course for the MK 46 turnaround course; (3) the prerequisite course should include two days of instruction on solid state fundamentals and eight days on front panel operation of the standard test instruments used to turnaround the MK 46; (4) the current 11-week turnaround course should be expanded to 12 weeks to provide an additional three days on film reading and two days in forebody turnaround; (5) more emphasis, guidance, and direction should be provided within the present time constraints on afterbody turnaround and on understanding the OP and what is being accomplished or established during forebody turnaround; (6) students should be provided forebody troubleshooting experience by programming malfunctions into the testing proceedures; and (7) that the MK 46 TM should be provided continuing MK 46 turnaround experience upon completion of Class "C" School Training.

Training Feedback on the AN/SPS-40 Radar System. SRR 69-23, April 1969. C. R. Bilinski, J. C. Saylor and L. S. Standlee. DDC Availability Number, AD-688 438.

A job analysis was made of the maintenance requirements of the AN/SPS-40 Radar System. A structured interview, based upon the job analysis, was then used to obtain information from a fleet sample of ETs concerning their experiences in maintaining the AN/SPS-40 Radar System.

The maintenance tasks causing the most difficulty tended to be those involving power conversion, alignment, and particularly those tasks involving maintenance of the Moving Target Indicator (MTI). Difficulties also occurred in understanding and using the system's technical manuals and test equipments.

As an aid to school personnel responsible for training, specific maintenance difficulties are described and identified by system component and by location in the present school curriculum.

Personnel and Training Requirements for the Deep Dive System MK2. WRR 69-7, May 1969. W. H. Scheu and K. H. Purdy. DDC Availability No. AD 854 260L.

This study analyzes the manning and training requirements for the new Deep Dive Systems to be installed in the new catamaran ASR's. Training requirements and a training plan are recommended in this study for the DDS MK2, the Underwater Breathing Apparatus MK VIII and MK IX and saturation diving qualification training. This training provides for interim and future training to be conducted at the new Naval School Diver Salvage.

Personnel and Training Requirements for the Direct Altitude Identity Readout (DAIR) System. WRM 69-29, June 1969. J. J. Stack and E. F. McGonagle. DDC Availability No. AD 855 250L.

Personnel training estimates for the operation and maintenance of DAIR are set forth in terms of rates, ratings, specific courses, course duration and curriculum breakdown.

Projected Manning and Training Requirements for the Advanced Interior Communications System (AICS). SRM 69-24, June 1969. Robert L. Ruenzel.

This report provides projected personnel manning and training requirements for the Advanced Interior Communications System (AICS) scheduled for installation aboard new construction ships commencing with the Fiscal Year 1973 shipbuilding program. Included are personnel requirements regarding the combined on-the-job and formal classroom training during the scheduled ship environmental test and evaluation of the AICS and the shipboard technical evaluation of the system.

Initial Personnel Implications of the Type A Quality Monitoring System (QMS). WRM 70-7, July 1969, 38 pp. S. J. Sokol and F. V. Waselewski. DDC Availability No. AD 860 171L.

This report is an initial study of the Type A Quality Monitoring System. It contains a description of the QMS equipments and projects personnel and training requirements for its operation and maintenance.

Manning and Training Requirements of Navy ADP Systems Phase III, The AN/UYK-5(V) or UNIVAC 1500 System: Qualitative Manning. WRM 70-3, July 1969. J. I. Bershtein. DDC Availability No. AD 847 181.

A determination of the qualitative manning requirements of the AN/UYK-5(V) or UNIVAC 1500 Automatic Data Processing System as used aboard Tenders and Repair Ships is made. The research includes study of the system's shipboard management, operation, maintenance, and programming functions.

Work requirements, imposed on shipboard personnel by both the hardware and software systems involved, were determined by examination of pertinent documents, interviews with knowledgeable persons ashore and afloat, and by shipboard observation under actual working conditions. Personnel requirements were then compared to the actual duties performed, formal and informal Navy training received, and the appropriate NOBC's and NEC's.

Personnel Implications of New Technological Developments: Undersea Technologies. SRM 70-3, July 1969. David A. Wilson. DDC Accession Number AD 694 475.

The purpose of this exploratory investigation is to develop and employ valid bases for forecasting the most likely effects of new technologies on future Navy personnel and training requirements. The research is directed at providing Navy managers with information upon which to base long-range personnel plans. Content is based on a study of technical and policy documentation, and interviews with numerous scientists, technicians, and planners, both in and out of the military establishment.

This interim report forecasts that: (a) future developments in undersea technologies will profoundly affect Navy personnel and training requirements during the next two decades, (b) both Navy and national programs in ocean sciences and ocean engineering will soon impose operational commitments on the Navy far beyond present personnel capabilities, (c) Navy personnel will routinely work as free divers at depths of 1,000 feet within the next decade and at all depths on the continental shelves within the next two decades, (d) the Navy will operate vehicles and occupy habitats in the deepest ocean depths within two decades, and (e) that parametric technologies will prove to be those related to deep-ocean visibility, heating, communications, navigation, and psychophysiology.

This report contains the following recommendations: (a) more detailed study of Navy and national oceanic programs and undersea technological trends, (b) more comprehensive reporting of projected effects on future Navy personnel capabilities and commitments, (c) diving training facilities and methods be improved on an urgent basis, and (d) greater Navy effort be directed to the support of production of more and better deep-ocean scientists and engineers.

ROCKEYE II and CBU24B/B Weapons Human Factors Input. HFS 70-1, July 1969. Lynn A. Lacey and Artis W. Donham. (Issued as Technical Note 4031-4 by The Tactical Air Weapons Branch, Weapons Development Department, Naval Weapons Center, China Lake, California.)

This report summarizes the efforts of the Human Factors Support Department (HFSD), Naval Personnel and Training Research Laboratory, in support of the product improvement program for the ROCKEYE II and CBU24B/B weapons. Because of a design change in the weapons, several possible human factor problems were recognized. In response to a request by the Tactical Air Weapons Branch (4031), NWC, China Lake, human factors research was carried out by HFSD. Research included studies designed to improve: (1) arming wire hookup; (2) cockpit switching; (3) weapon downloading; and (4) MK339 fuze safe-arm indication. Research findings are presented and procedures are recommended to improve performance of the above tasks.

The Development of a Human Effectiveness Function Allocation Methodology (HEFAM). SRM 70-11, October 1969. Marilee N. Connelly and Joe E. Willis. DDC Accession Number AD 699 173.

This report was a part of the HEFAM project which is attempting to develop a workable cost/effectiveness methodology for man/machine function allocation. The methods used were: (1) review the cost/effectiveness and function allocation literature, and (2) interviews with engineers, data analysts, programmers, personnel researchers and psychologists in the areas of cost/effectiveness, human factors, personnel research, and equipment design. Included in the report are analyses of: (1) the types of mathematical models required, (2) computer storage capacity, (3) five different possible sources of data, and (4) four possible methods of data collection.

It was recommended that future development of HEFAM should include: (1) development of the concept of human effectiveness (as opposed to reliability), (2) development of the data processing system, (3) development of better data collection methods, (4) development of computational formulae, and (5) development of prediction methodology.

An Experimental Evaluation of the MK 339 Fuze Safety Display. HFS 70-3, October 1969. Lynn A. Lacey and Artis W. Donham. (Issued as Technical Note 4031/HFSD-2 by The Weapons Development Department, Naval Weapons Center, China Lake, California.)

As part of a human factors program in support of the Rockeye Weapon System, the safety display of the MK 339 fuze was evaluated.

Safe and armed fuzes were presented to 12 subjects under simulated blackout conditions. The fuzes were placed in a mock-up of the Rockeye weapon. One group of six subjects was allowed to view the fuze conditions in normal lighting and was given a verbal briefing. The other group of six subject was given only the verbal briefing.

No errors in safe-arm determination were made by either group over a total of 96 trials. However, subjects given only the verbal briefing were not certain of the correctness of their responses on first trial responses. Consequently, it is recommended that personnel required to judge the status of the MK 339 fuze be given both verbal briefings and illustrative demonstrations of safe-arm indication.

Interim Quantitative Manpower Projections for Proposed Hydrographic Survey Ship System (AGS) Candidate Configurations (NAVSHIPS Subproject S46-27012, Task 14408). SRM 70-10, October 1969. V. M. Malec and A. Lansville. DDC Accession Number AD 861 373L.

This personnel research report basically enumerates the quantitative Navy manpower requirements for various proposed candidate configurations of a New Hydrographic Survey Ship System (AGS). Included is a description of the various AGS candidate proposals and a breakdown of the estimated personnel requirements, in preliminary qualitative terms, for three major subdivisions of the total ship system which include: (1) embarked survey vehicles, (2) embarked survey team, and (3) ship control. The information contained in this report has been designed to assist in the development of the AGS PTA and also to provide project and congizant BUPERS personnel planning divisions with the projected quantitative Navy manpower implications of the AGS development program.

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HUMAN FACTORS SUPPORT (Continued)

ROCKEYE II and CBU24B/B Weapons Human Factors Input - Supplement I, Failure Mode Analysis. HFS 70-4, October 1969. Dan W. Wagner. (Issued as Technical Note 4031-4, Supplement I by The Tactical Air Weapons Branch, Weapons Development Department, Naval Weapons Center, China Lake, California).

The report presents a Failure Mode Analysis based on possible hookup, selection, and release combinations of the MK7 and SUU 30B/B dispenser when using the MK 339 Mechanical Time Fuze. This dispenser is used for the Rockeye II weapon.

Manned Transparent Submersibles: Human Factor Implications and Design Characteristics. HFS 70-5, December 1969. Lynn A. Lacey, Charles B. White and Jack L. Mahan, Jr. (Issued as Ocean/Marine Sciences Working Paper, by the Naval Undersea Research and Development Center, San Diego, California (Code 04).)

This paper was prepared as part of the Human Factors Support Department's FY 1970 support of the Naval Undersea Research and Development Center, San Diego. The paper compares the relative merits of glass and plastic hulled submersibles. More importantly, areas in need of research and human factor implications of transparent submersibles are presented.

Computerized Analysis of Natural Language Test: An Annotated Bibliography of Selected References. HFS 70-6, January 1970. Lynn A. Lacey. (Issued as HFSD Working Paper 70-2 by the Analysis Methods Group (Code 1404), Naval Undersea Research and Development Center, San Diego, California.)

This paper presents annotated bibliographic information relevant to the computerized analysis of natural language. The project was conducted in support of the Analysis Methods Group (Code 1404), Naval Undersea Research and Development Center, San Diego. The paper consists of 20 selected references with anotations.

Review of Changes to the Personnel Requirements of the PLAINVIEW (AGEH-1). WRM 70-30, February 1970. R. I. Zweibel. DDC Availability No. AD 865 770.

This report is concerned with the Manpower Authorization for research hydrofoil AGEH-1 PLAINVIEW. It lists the current Authorization (OPNAV 1000/2), and the requested Authorization (OPNAV 1000/3) which proposes an increase of enlisted billets. The duties as well as the work requirements are listed for all current and proposed personnel to establish the need for the requested billets on the AGEH-1.

Human Factors Methods Development and Test: I. Evaluation of the Corrective Maintenance Burden Prediction Procedure. SRM 70-14, March 1970. Orvin A. Larson and Joe E. Willis. DDC Accession Number AD 704 857.

This report documents an evaluation of the usefulness of the Corrective Maintenance Burden (CMB) Prediction Procedure to Applied Systems research. The approach used was to analyze the basic structure of CMB and then to operationally apply CMB to an actual developing electronic system. CMB was applied to two dissimilar systems by the Applied Systems personnel researchers assigned to those systems. An analysis of the results of the format analysis and operational tests led to the following conclusions: (a) CMB is a significant improvement in the quantification and systematization of maintenance personnel predictions; (b) potential users of CMB have not received adequate information on its capabilities; (c) on-going system redesign and inadequate documentation will probably reduce CMB effectiveness in the late stages of system development; (d) CMB requires an overall organizational index to improve user access to its contents.

Personnel and Training Requirements for CHAFFROC System (MK 28 Mod 0). WRM 70-33, March 1970. M. Medina. DDC Availability No. AD 867 615L.

This report directs attention to the skill, knowledge and training requirements necessary to perform operational and maintenance duties on the CHAFFROC MK 28 Mod 0 System.

Also contains staffing recommendations, based upon various conditions of readiness.

Shark Screen In a Simulated Ocean Survival Environment. HFS 70-8, March 1970. Jack L. Mahan, Jr. and Lynn A. Lacey. (Issued as NUC Technical Publication 173 by the Marine Bio-Science Division, Naval Undersea Research and Development Center, San Diego, California.)

Experimental ocean and pool tests of the shark screen are described and the results of the tests are compared. The following information is presented: (1) proper instructional methods, (2) human operation characteristics, (3) mean operation time, and (4) operational influences of training experience, injury status, water condition, and flotation collar dimensions. Design changes of the shark screen are recommended to improve operator performance. Survival uses of the shark screen other than shark protection are recommended.

Task Data Elements Verification Test for New Systems Personnel Requirements Data System (NSPRDS). SRM 70-15, March 1970. Robert C. Megling, Gordon M. Campbell, and Joe E. Willis. DDC Accession Number AD 868 218L. For Official Use Only.

A New Systems Personnel Requirements Data System (NSPRDS), formerly called Personnel Requirements Information System Methodology (PRISM), is being developed for the orderly generation, maintenance, updating, and application of detailed task analysis information throughout the development cycle of Navy weapon and support systems. Previous reports have established the feasibility of the concept, identified the general classes of data required during system development, and illustrated a standardized task format.

The purpose of this report is to document the results of the task data element verification test and the preliminary computer software requirements to support the information processing needs of NSPRDS.

The verification test demonstrated the applicability of the NSPRDS task statement format, task data elements and formats, and the taxonomy of Navy work verbs to human factors data processing requirements during system design.

ACLS SPN-42/10 Training Follow-Up Study. WRM 70-37, May 1970. J. J. Stack and L. T. Germaine. DDC Availability No. AD 869 554L.

This report contains information and recommendations for the establishment of a refresher training program for maintenance personnel required to maintain AN/SPN-42/10 equipped ships to operate in Modes 1A and II.

Human Factors Methods Development and Test: II. Evaluation of the Automated Operational Sequence Diagram (OSD). SRM 70-17, May 1970. Orvin A. Larson and Joe E. Willis. DDC Accession Number AD 707 719.

This report documents an evaluation of an automated version of the Operational Sequence Diagram (OSD) for use in personnel research. Automation of the OSD herein refers to the use of alphanumeric characters to replace geometric symbols and the use of non-computerized automatic data processing (ADP) methods to produce the OSD. Inhouse personnel researchers were surveyed to determine the current usage of OSDs and the user perceived strengths and weaknesses of ODSs for personnel research. Three variations of a basic automated OSD were developed and evaluated. Two of the automated OSD formats were evaluated by application to Navy weapon and support systems which were under development. A third automated OSD format was subjectively evaluated by personnel researchers but was not applied to an actual system due to time considerations. It was concluded that the automation of the OSD can alleviate the primary user reported problem of time-consuming OSD preparation and revision in personnel research. It was further concluded that the automated OSD is a useful human factors tool for aiding the derivation of personnel implications from systems in the RDT&E cycle.

Personnel and Training Implications of the Deep Diving Systems. WRR 70-6, May 1970. O. E. Painter. DDC Availability No. AD 706 342.

This study pertains to the need of identification for personnel and training requirements in the Deep Dive Systems. In addition, the study points out the diver shortages, lack of incentives of diver personnel, and other subjects and areas of the Diving Community with deficiencies.

Personnel Requirements for the Amphibious Assault Ship (LHA) Advanced Interior Communications System (AICS). SRM 70-18, May 1970. Robert L. Ruenzel. DDC Accession Number AD 869 464L.

This report provides projected personnel and training requirements for the Advanced Interior Communications System (AICS) scheduled for installation aboard new construction Amphibious Assault Ships (LHAs). Included are requirements for a new Class "C" training program and the assignment of a new NEC to identify personnel trained in maintenance and repair of the AICS.

Deep Ocean Test-In-Place-and-Observation System Operator's Manual. SRM 71-4, June 1970. Charles L. Eversole. DDC Accession Number AD 876 204.

Operation,assembly and maintenance of the DOTIPOS system, including all subsystems and integral components, has been described. Specific directions for operation of all controls and general instructions for assembly and maintenance are provided. If more detailed information is required, the use should consult available manuals such as the contractor's equipment manual or the Winch Manual. The equipment manual provides a technical description of all components and an extensive parts list.

Human Engineering Design Criteria Checklists for Military Systems, Equipment, And Facilities. HFS 70-11, June 1970. L. A. Lacey. (Issued as HFSD Working Paper 70-7 by Naval Personnel and Training Research Laboratory, San Diego, California.)

This report presents the development of human engineering checklists derived from MIL-STD-1472. Included are a discussion of the construction, description, and uses of the checklists. The checklists are included as appendices.

Personnel and Training Requirements for the ASR-21 Rescue Control Center. WRR 70-9, June 1970. J. F. DeLuca and J. F. Noble. DDC Availability No. AD 709 141.

This report concerns itself with the identification of personnel and training requirements for the Rescue Control Center (RCC), ASR-21 Class. Information in this report will be utilized in establishing initial training courses and the initial training site for ASR-21 and ASR-22 personnel.

Sea States and Shipboard Operator Performance and Maintenance. HFS 70-10, June 1970. L. A. Lacey. (Issued as HFSD Working Paper 70-6 by Advanced Design Group (Code 1045), Naval Undersea Research and Development Center, San Diego, California.)

This report presents results of a survey on the effects of sea states on shipboard operator and maintainer performance, equipment operation, and maintenance requirements.

New Systems Personnel Requirements Data System (NSPRDS) Computer Software Subsystem Developments. SRM 71-3, July 1970. Robert C. Megling. DDC Accession Number AD 710 396.

A New Systems Personnel Requirements Data System (NSPRDS), formerly called Personnel Requirements Information System Methodology (PRISM), is being developed for the orderly generation, maintenance, updating, and application of detailed task analysis information throughout the development cycle of Navy weapon and support systems. Previous reports have established the feasibility of the concept, identified the general classes of data required during system development, and illustrated a standardized task format.

The purpose of the research reported herein was to evaluate the applicability of the Commercial Data Management System (CDMS) developed by System Development Corporation (SDC) of Santa Monica, to manipulate human factors data in a modern computer environment. Optimal computerization of NSPRDS can be accomplished through adaptation of an existing time-sharing computer software system rather than the creation of a new computer software system for the specific human factors information flow within the Navy development cycle. The Commercial Data Management System (CDMS) developed by Air Force Human Resources Laboratory (AFHRL) and System Development Corporation (SDC) was found to best satisfy the NSPRDS software criteria. Further, preliminary use of CDMS suggests, with a high degree of probability, that CDMS can fulfill the NSPRDS data management requirements.

Task Analysis Reduction Technique (TART) for the Quantification of Human Performance. SRM 71-7, September 1970. Robert H. Ellis. DDC Accession Number AD 711 807.

A Task Analysis Reduction Technique (TART) for collecting human factors information was developed and applied to the Anti-Submarine Warfare Tactical Data System. TART is a specific procedure for analyzing the man/machine interface which allows the researcher to analyze sequential properties of the man/machine interaction. The technique is based on an analysis of the interface at a task level and uses closed circuit television and video tape recording apparatus. A trial application was performed using four air detector/tracters who were presented a one-hour air scenario in the Anti-Submarine Warfare Tactical Data System. The results section presents various breakdowns of the TART data and support the conclusion that TART can provide valuable insight into man/machine design and training effectiveness decisions.

Design of a Non-RDT&E Systems Equipments Monitoring System. WRM 71-20, October 1970. O. E. Vroom & R. E. Willis. DDC Availability No. AD 716 413.

The FY 70 Research Program for Phase I, Systems Requirements Identification, of the development of a Non-RDT&E Systems/Equipments Monitoring System was summarized, the basic parameters of the research problem were established, consumer information requirements were defined, and potential sources of systems information in the NAVSHIPS Equipment Acquisition Process were identified. This information was used in describing the design specifications of a preliminary Non-RDT&E Systems/Equipments Monitoring System including concepts, functions, structure and basic procedures.

Personnel and Training Requirements for the Deep Submergence Rescue Vehicle (DSRV). WRR 71-3, October 1970. J. F. Noble. DDC Availability No. AD 715 013.

This report concerns itself with the identification of personnel and training requirements for the Deep Submergence Rescue Vehicle (DSRV). Information in this report will be utilized in establishing subsequent training courses and the initial training site for ASR-21 and ASR-22 personnel.

Sea States and Shipboard Operator Performance and Maintenance. SRM 71-5, December 1970. Lynn A. Lacey. DDC Accession Number AD 716 414.

The purpose of this research is to evaluate the effects of sea states on the operation and maintenance of radar, radio, and sonar shipboard equipment.

Little research has been conducted on the effects of sea state conditions on the operation and maintenance of shipboard equipment. The present research extends the available data on the effects of sea states.

Operation and Maintenance Evaluation questionnaires, requiring evaluation of the effects of sea states, were administered to students and instructors at Class "B" and "C" Schools.

Both operator and maintainer performance are reported to be hindered at high sea states, but most ship operating time is at low sea states. Equipment performance is reported to be more greatly hindered at higher sea states than at lower sea states. A greater amount of equipment maintenance is reported to be required at higher sea states than at lower sea states. It is recommended that research be expanded to determine the feasibility of stable Naval ships, and that further personnel research be conducted to determine the effects of unstable ship conditions on personnel performance and equipment operation and maintenance.

Automating the Operational Sequence Diagram (OSD). SRM 71-8, December 1970. George F. Lahey. DDC Accession Number AD 718 842.

Automation of operational sequence diagrams (OSDs) is required to permit timely preparation. Conventional methods of preparing OSDs (drafting and pasteup) are time consuming and outmoded. Using OSD data in card format makes it possible both to produce the OSD in a reasonable time and to accomplish revision as system design changes. This report describes a serviceable and simple method of OSD preparation using standard automatic data processing (ADP) equipment.

Size and Distance Estimation From an Acrylic Submersible. STB 71-8, March 1971. Charles L. Eversole. DDC Accession Number 722 320.

In an experimental evaluation of the visual properties of NEMO, a 5.5 foot diameter acrylic submersible, it was found that size and distance of underwater targets (white discs) were dramatically underestimated. In many cases this underestimation was in excess of 50% of the true size and/or distance. This result however, is in partial agreement with theoretical predictions established for the optical properties of NEMO. The results of this experiment differ from theory in that error rates (amount of underestimation) maximize at distances of 20-30 feet, whereas theory predicts an increase in errors (underestimation) to much further distances. Several reasons are offered for this discrepancy, including water turbidity, individual set or bias, and the effect of experience. It was concluded that with training which includes accurate information on true target size and distance operators can accurately estimate size and distance.

Advancing the Application of Job Performance Aids Within the Navy: I. Development of Systematic Approaches. SRR 71-24, April 1971. Ray E. Main, Robert J. Harrigan and Eugene A. Hooprich. DDC Accession Number AD 722 319.

This is the first in a series of reports by the Naval Personnel and Training Research Laboratory (NPTRL) covering investigations of the use of job performance aids. A job performance aid is a device designed to provide information to assist the worker in on-the-job task situations. This report concerns initial efforts to identify methods for furthering job aid development and implementation. Included in this report are the results of a literature review which confirmed that introducing job aids into task situations can reduce training requirements and improve task performance. Factors which are believed to have had a limiting influence on job aid employment are discussed. Preliminary accomplishments are cited including (1) Design of a categorization of job performance aids, (2) Construction of a survey questionnaire for gathering data on present conditions of job aid application within Navy ratings, and (3) Development of a job performance aid within the context of a nontechnical Navy task area.

Determination of Navy Training Capability for the Direct Altitude Identity Readout (DAIR) Systems, AN/TPX-42. WRM 71-45, May 1971. J. J. Stack & J. C. Hamilton. DDC Availability No. AD 884 776.

This study provides personnel and training requirements to support the introduction of the DAIR System at selected Navy shore facilities. The personnel and training impact related to a proposed DAIR/BRITE interface and future planned DAIR developments are also discussed.

Data Systems Technician Maintenance Training Requirements for the AN/UYK-7(V) Computer. WRM 71-42, June 1971. W. X. Smith, Jr. DDC Availability No. AD 884 649L.

Skills, knowledges, and related training requirements/implications applicable to Data Systems Technicians for the operation and maintenance of the AN/UYK-7(V) computer are determined. Investigation includes study of technician requirements for isolating, detecting and repairing a malfunction in the computer. Work demands required of the Data Systems Technicians are developed through appropriate sources, including literature review, interviews, observation, conferences, and discussions with knowledgeable military, civilian and contractor personnel. Recommendations are made to assist Navy planners in deriving training requirements, and developing training plans for the introduction of the AN/UYK-7(V) computer to Data Systems Technician School.

Personnel and Training for FBM Tender Special Weapons and Calibration Program. WRM 71-50, June 1971. W. C. Fisher. DDC Availability No. AD 886 310L.

Navy billets are established when deemed necessary. The source from which these billets may be derived vary. In order to provide adequate re-entry body support (personnel) it was determined that additional billets were required of the GMT rating on board the FBM tenders. Compensation billets were available from the USS OBSERVATION ISLAND (AG-154). The ET-1598 and the IM/OM 1821 billets on board the FBM Tenders were found to be sufficient quantity; however, they were not being filled. Additionally, there is a definite deficiency in proper training (depth and scope). Recommendations are made concerning billet requirements, qualitative information on all rating groups, and training required to support the FBM Calibration Recall Program. Other information relative to retention is also provided.

Preliminary Personnel and Training Requirements for the SSN-688 Central Computer Complex. WRM 71-48, June 1971. J. F. Noble. DDC Availability No. 885 656L.

This report identifies the personnel and training requirements in support of the Central Computer Complex for the SSN-688 Class Submarines and the primary user systems (Fire Control and Navigation).

Update and Evaluation of the Corrective Maintenance Burden Prediction Procedure. SRM 71-14, June 1971. Orvin A. Larson. DDC Accession Number AD 726 198.

A partial update and evaluation of the Corrective Maintenance Burden (CMB) was accomplished. Data were collected to update and expand the CMB Failure Rate Data Tables. An evaluation was made of the predictive accuracy of the CMB. The CMB performed well on the OMEGA Navigation Receiver, AN/SRN-12. The CMB performed less well, however, on a newer and more complex system, the Advanced Interior Communications System. Several weaknesses of the CMB were noted and directions for a follow-on maintenance prediction procedure were discussed.

Factory Training Course Analysis for the Ships Advanced Electronic Warfare System. WRM 72-5, August 1971. C. J. Barron. DDC Availability No. AD 887 354L.

Prerequisites for SHORTSTOP factory training as well as the factory training course itself are examined in the areas of operation, maintenance, and supervision. Recommendations for changes in the quality of training are made with particular emphasis being given to the aspects of the electronic warfare specialist and the data systems technician training.

Personnel and Training Requirements for Stream "TOPSIDE" Equipment Aboard AFS, AO-51 Class and AOR Type Ships. WRM 72-8, August 1971. K. E. Allison. DDC Availability No. AD 729 251.

This study presents personnel requirements for "TOPSIDE" Stream equipment aboard certain replenishment ships. Ship manning estimates were based on preventive maintenance documents prepared expressly for Stream equipments.

Weapons Systems Personnel Requirements Evaluation: Determination of Human Factors Suitability of Weapons Systems During Operational Tests and Evaluations. WRM 72-9, September 1971. J. L. Long. DDC Availability No. AD 885 518L.

This report reviews exploratory research of the Navy's operational test and evaluation systems as a source of data for correction and verification of manning and training predictions. It contains an evaluation of a guide developed for human factors test and evaluation and notes specific problems associated with feedback of human factors data within the Navy's RDT&E cycle.

Special Personnel Requirements for Navy Hydrofoil Operation and Maintenance. WRM 72-17, January 1972. R. I. Zweibel. DDC Availability No. AD 890 559L.

This report discusses the requirements for new NEC's for personnel within the Navy hydrofoil program. Also discussed are the potential need for a new engineering rating for gas turbine operation and maintenance, and general hydrofoil orientation/underway and technical training. Special identification and qualification of hydrofoil personnel is another area taken into consideration.

Submarine Emergency Communications Transmitter (SECT) AN/BST-1 Personnel and Training Requirements for Tender Installation and Maintenance Personnel. WRR 72-7, April 1972. H. M. Worth. DDC Availability No. AD 894 159L.

This report contains recommended changes to the safety precautions coverage of the Tender Maintenance Course for the SECT system that are appropriate to provide experienced and knowledgeable non-ordnance rating personnel for installation and maintenance of the SECT system by tender personnel. These changes are based on NavOrd OP 5, Volume 1, NavOrd OP-3347, and NavOrd OP-3565.

Qualitative/Quantitative Personnel Resources for the Torpedo MK 48 Mod 1 Weapon System. WRM 72-34, June 1972. O. D. Greene & H. L. McLinden. DDC Availability No. AD 901 055L.

This report presents an analysis of the qualitative/quantitative personnel requirements and resources necessary to accomplish manning of Torpedo MK 48 intermediate maintenance facilities. It identifies the source NECs from which personnel may be drawn and a recommended schedule for the lateral flow into the MK 48 training pipeline.

Technician Requirements for Maintenance of Microelectronics Equipments in the Fleet. SRR 73-2, July 1972. J. H. Steinemann and J. D. Coady. DDC Accession Number AD 748 040.

The increasing development and utilization of microelectronic technology in Navy shipboard equipments imposes changing demands upon the technical personnel force needed to meet fleet electronics maintenance responsibilities. This investigation assessed the present and near-future maintenance task requirements of microelectronics equipments and evaluated the extent to which shipboard technicians are qualified to meet assigned maintenance responsibilities.

Evaluative information and data were obtained through a series of visits to area electronics facilities and by a questionnaire survey of Pacific Fleet technicians responsible for microelectronics equipment maintenance.

The obtained evidence shows no critical Navy-wide maintenance problem directly related to the transition to microelectronics equipment. A continuing need exists, however, for greater emphasis on practical aspects in electronics training and for more structured on-the-job training. There is also a need to optimize logistic support including replacement parts, test equipment, and job aids.

Continuous monitoring of microelectronics expansion into the fleet is recommended to insure that changing maintenance task demands are matched by training and support modifications.

Human Factors Suitability of Naval Systems: An Analysis of COMOPTEVFOR Test and Evaluation Reports. WTR 73-3, August 1972. J. L. Long.

This report reviews the human factors suitability of new naval weapons systems which were evaluated by the Navy's Operational Test and Evaluation Force between January 1971 and June 1972. A variety of systems are reviewed. Results include information relating to qualitative and quantitative manning, training, human performance, and human engineering.

Initial Analysis of Human Resource Implications for Small Tactical Aerial Mobility Platform (STAMP). Special Report, August 1972. Ernest A. Koehler and Anthony Lansville.

Engineering studies and experiments are being conducted by the Naval Weapons Center, China Lake, California, directed toward the development of a simplified Small Tactical Aerial Mobility Platform (STAMP). Personnel research has been accomplished by the Naval Personnel and Training Research Laboratory in support of this engineering effort. Projected quantitative and qualitative personnel requirements are delineated for optional levels of design complexity, together with related life cycle costs.

Impact of Electronics Packaging on Cryptographic Manning and Training Requirements--Preliminary Analysis, X32-96T. Developmental Analysis Report, January 1973. William J. Stinson.

The method selected for packaging advanced microelectronics circuitry into functional assemblies will have a substantial impact on operational effectiveness and related logistics support requirements (including manning and training resources). Information concerning existing equipment packaging practices and problems was obtained through discussions with experienced personnel at various activities--including the Naval Electronics Laboratory Center (NELC--Design Engineering Division), selected ships, and selected aircraft maintenance support facilities ashore. Consideration of microelectronics circuitry characteristics--functional module size, complexity, reliability, repairability, etc.--provided a basis for determination of related manning and training implications. Key conclusions resulting from this analysis are as follows:

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1. The ability to make desired improvements in operational effectiveness involving retrofit of new equipments or reconfiguration of existing equipments is seriously hampered by the inflexibility of existing shipboard packaging arrangements--the cost of installation services often exceeds the purchase price of new equipment. Special effort needs to be directed toward the development of specifications facilitating configuration flexibility--including provisions for simplified repositioning or removal/replacement of interconnecting cables, air conditioning ducts, and cabinet mounting base structures.

2. The implementation of reduced-size, relatively inexpensive microelectronics assembly configurations will result in higher level integration and automation of operational functions. Operation manning levels will be reduced as broader-scope decision making responsibilities are enhanced. Maintenance manning levels could be dramatically reduced at organizational level facilities as a result of major improvement in equipment reliability and adoption of a "module replacement" corrective maintenance philosophy.

An Initial Approach to Evaluation of Personnel Performance in Operation and Maintenance of Small Lift Devices--STAMP. Special Report, January 1973. Ernest A. Koehler, Anthony Lansville and Artis W. Donham.

Work is continuing at the Naval Weapons Center, China Lake, California, toward the development of experimental small lift devices (flight platforms) which are to be piloted by relatively unskilled operators. Selection criteria and performance measures must be carefully determined for such personnel in order to assure effective operation under normally hazardous conditions. This report outlines some of the factors which must be considered in selecting reliable flight operators and evaluating their performance.

HUMAN FACTORS SUPPORT (Continued)

Military Personnel Requirements for the Amphibious Assault Landing Craft Program Experimental Test Unit. WTR 73-21, April 1973. R. A. Sniffin.

This report discussed the personnel requirements for the operation, maintenance, and support of a new amphibious assault landing craft during Navy tests and trials. System descriptions, operational requirements, maintenance workload analysis, test program objectives, and policy constraints are used to determine personnel requirements. An organizational structure that will utilize manpower effectively to accomplish program goals is presented. Cross-utilization of personnel to provide back-up for critical operational stations is recommended. Factors relating to ability and motivation are discussed as potential selection criteria.

Human Factors and Navy Operational Evaluations. WTR 73-30, June 1973. J. L. Long.

The feasibility of using evaluation techniques developed under exploratory development to assess the human factors suitability of weapons and support systems undergoing operational test and evaluation is discussed. Human factors implications resulting from the application of techniques are analyzed in terms of probable impact on weapons system acquisition. The utilization of COMOPTEVFOR project officers as human factors investigators with assistance being provided by human factors analysts is emphasized.

An Initial Approach to Evaluation of Personnel Performance in Operation and Maintenance of Small Lift Devices--STAMP (Revision to January 1973 Report). Special Report, June 1973.

Results of continuing personnel research during the second half of FY 1973 in support of the STAMP development effort are presented in this report. The material presented in an earlier report (January 1973) is updated, involving relatively minor changes in content.

RESOURCE COSTS

Supplement to Report on Enlisted Personnel Replacement Costs. PRAW Report No. 63-22, August 1963.

This report presents research findings of the second portion of a study dealing with the development of enlisted personnel replacement costs. Report No. 63-8, May 1963, provided replacement costs for three ratings. The present report, which provides replacement costs for seventeen additional ratings, should be used in conjunction with the May report.

Enlisted Personnel Replacement Costs. PRAW Report No. 64-4, February 1964.

This report contains replacement costs for BM, ET, FT, MT and RM ratings as of February 1964, based on the latest available information and all known adjustments, including the increases in pay and allowances allocated by the Congress in 1963.

Methods and Problems of Computation of Enlisted Personnel Costs. PRAW Report 64-56, February 1964.

This report provides in some detail an explanation of the methodology employed in the computation of enlisted personnel costs. Sources of information have also been indicated and analysis of problem areas which were encountered in the course of research has been made.

Enlisted Personnel Costs for Use in SEAHAWK Cost Effectiveness Comparisons (FIRST REPORT). Personnel Research Memorandum, Report No. ND 64-63, May 1964. (W)

Cost data sheets for 27 enlisted ratings envisioned to man SEAHAWK ships are presented. The data sheets are subdivided by rating and by first and second enlistments. An explanation is also presented of the development methodology and application of personnel cost information.

Enlisted Personnel Costs for Use in ASW Surface Ship Systems Cost Effectiveness. PRL Report No. ND 65-40, Washington, D. C., December 1964. L. O. Mann, Jr., W. H. Primas, Jr. and R. J. Jackson.

Updates and extends enlisted personnel cost data on ratings and rates employed in ASW surface ships originally presented in BuPers Memo ND 64-63, May 1964.

Officer Personnel Costs: Naval Academy Graduate. PRL Report No. WRM 65-3, Washington, D. C., April 1965. J. N. Clary.

Presents personnel cost information on a Naval Academy Graduate from initial procurement through one year past initial service obligation.

Personnel Costs for Ten Selected Ratings (AC, AE, AQ, AT, AX, ET, FT, MM, RD, ST). PRL Report No. WRM 65-2, Washington, D. C., April 1965. J. N. Clary and S. Arzigian.

Presents personnel cost information on the ten ratings through 10 years of service. These costs are those identifiable costs incurred by the Navy. Prepared for use by the Alford Board studying retention.

Officer Personnel Costs: NROTC-Regular, NROTC-Contract. PRL Report No. WRM 65-6, Washington, D. C., May 1965. J. N. Clary.

Presents personnel cost information on officers procured through the NROTC programs. The period covered is from initial procurement through one year past expiration of initial active service obligation.

Officer Personnel Costs for Use in Surface Ship Systems Cost Effectiveness Comparisons. PRL Report No. ND 65-63, Washington, D. C., June 1965. R. J. Jackson, L. O. Mann, Jr., and W. H. Primas, Jr.

Presents personnel costs for officers expected to man ASW surface ships. This report supplements enlisted cost data presented in ND 65-40, December 1964.

Training Equipment and Building Amortization Study. PRL Report No. WRM 65-10, Washington, D. C., June 1965. B. J. Goodyear.

This progress report discusses the feasibility of including two additional factors in computing BuPers training costs. These are the amortization costs of buildings and expensive training equipment.

Officer Personnel Costs: Aviation Officer Candidate (AOC). PRL Report No. WRM 66-1, Washington, D. C., July 1965. J. N. Clary. DDC No. AD 643 844.

Costs of officers procured through the Aviation Officer Candidate (AOC) Program from initial procurement through one year past initial service obligation are presented for several types of aircraft.

Cost information should prove useful for such purposes as planning, budgeting, and the officer retention effort.

A Selected Annotated Bibliography and Cost Effectiveness and Man/Machine Function Allocation. SRM 66-4, August 1965. J. Scott Webb, Joe E. Willis, and Ronald D. Anderson. DDC Availability Number, AD-468 834.

This bibliography includes the references and summaries of over 100 publications pertaining to system costs, system effectiveness, cost-effectiveness ratios, and man/machine function allocation.

Officer Personnel Costs: Naval Aviation Cadet (NAVCAD). PRL Report No. WRM 66-14, Washington, D. C., November 1965. J. N. Clary. DDC No. 483 425L.

Information on the cost of officers procured through the Naval Aviation Cadet Program, from procurement through one year past initial active service obligation, have been determined. These costs have been related to the total Navy investment in pilots for various types of aircraft.

Financial Management Function for Industrial Type U. S. Naval Air Stations and Master Jet Air Stations. U. S. Navy Staffing Criteria Manual for Activities Ashore, OPNAVINST 5310.5A, PRL Washington, D. C., December 1965. W. T. Lyons.

Training Equipment and Building Amortization Study. PRL Report No. WRM 66-29, Washington, D. C., January 1966. B. J. Goodyear. DDC No. 643 845.

The cost of training is one of the major elements involved in the computation of personnel costs for officers and enlisted men. Training costs as presently computed may be considered as only partial costs because amortization of buildings and expensive training equipment are not included. The training cost reporting system of several schools were studied. Data necessary to compute the amortization factors were generally available to the schools.

As a result, it is recommended that the BuPers training cost reporting system incorporate the amortization factors as related to the training costs. Due to the variation of amortization factors among ratings, only certain ratings which have meaningful amortization factors that apply to training costs after a period of two years should continue to report to BuPers.

Training Time and Costs for Selected Ratings and NEC's. PRL Report No. 66-33, Washington, D. C., March 1966. J. N. Clary. DDC No. AD 643 843.

To meet the urgent requirements of the Chief of Naval Personnel, research was conducted to provide firm costs on enlisted training time to be used as inputs to the Career Premium Computer Program for determining Pro Pay eligibility. Specifically, information was presented on the training time and funds invested in enlisted personnel from initial procurement through appropriate basic training for 25 ratings and advanced and/or specialized training for 174 Navy Enlisted Classification Codes.

The Feasibility of Deriving a Cost/Effectiveness Formula for Man/Machine Function Allocation. SRM 67-4, September 1966. Marilee N. Connelly. DDC Availability Number, AD-639 674.

This report presents a summary of progress made in a continuing investigation into the feasibility of deriving a cost/effectiveness formula for man/machine function allocation. A preliminary cost/effectiveness formula is presented with an evaluation of the sources and availability of the data inputs required by the formula.

Using the preliminary formula and methodology as a basis for the analysis, it was concluded that adequate measures of cost are available but that adequate measures of variable effectiveness have not yet been developed. Due to the complexity of the cost/effectiveness formula and methodology and to the lack of accessibility of input data, a large amount of time and money will be required to perform function allocation analyses. It was determined that the derivation of a cost/effectiveness formula for man/machine function allocation is feasible. At this time cost/effectiveness analysis seems applicable to most cases of function allocation and appears to offer a reliable method for the allocation of functions between men and machines.

Design of an Enlisted Personnel Cost Analysis System. PRL Report No. WRM 67-11, Washington, D. C., October 1966. J. L. Bershtein. DDC No. AD 643 965.

This memorandum provides in some detail the procedures and concepts of the enlisted personnel cost analysis system developed by the Personnel Research Laboratory. Sources of information and problem areas encountered during the course of research have also been indicated.

Personnel Costs: An Analysis. PRL Staff Paper, Unnumbered, Washington, D. C., October 1966. S. Arzigian.

An overview of the Personnel Research Laboratory (PRL) project on personnel costs is presented in this paper. Highlighted herein are the problems encountered in the course of research in the design of a personnel cost analysis system--problems which must be resolved if the Navy is to have a standard personnel cost system. Need to computerize the Personnel Cost Analysis System developed by PRL is discussed, and need to establish a BUPERS office to monitor the cost analysis system on an operational basis is also discussed.

Interim Conformal/Planar Array Sonar System Personnel Cost Analysis. SRM 67-11, December 1966. E. A. Erickson and A. Lansville. DDC Availability Number, AD-814 512.

This report is an initial attempt to provide the Project Tc nical Director (PTD) and participating laboratories in the Conform Planar Array Sonar Program with useful personnel costs and training information in determining System maintainability requirements and man/machine trade-offs.

Existing training programs for Sonar Technicians (STs) on the AN/SQS-26 Sonar System have been used to extrapolate and predict costs and training implications for the Conformal/Planar Array Sonar System.

In addition, three proposed manning and training plans which have application to the Conformal/Planar Array Sonar System are presented. In each plan, numbers of personnel, competence levels, training time, training costs, and man-year costs are shown.

Finally, this report suggests several relevant personnel aspects which in all probability will affect System development, e.g., equipment displays, maintenance requirements, etc.

Proposed Content of an Enlisted Personnel Cost Model. PRL Report No. WRM 67-18, Washington, D. C., December 1966. R. Gettings. DDC No. AD 646 217.

This report presents an outline of a proposed enlisted personnel cost model. The need to develop such a computerized cost model has become evident with the increasing number of requests for cost data from a wide variety of Navy and Department of Defense offices.

The approach has involved an analysis of the present enlisted personnel cost system in terms of input, processing, and output. Revised outputs have been designed to provide concise reports of information frequently required. Modifications to the training cost reports are recommended as necessary to provide the revised outputs.

Training Time and Cost for Selected Ratings and NEC's. PRL Report No. WRM 67-20, Washington, D. C., December 1966. J. N. Clary. DDC No. AD 646 238.

Reports FY 66 data on enlisted training time and costs to be used as inputs to the Career Premium Program for determining Pro Pay eligibility. Specifically, it presents the training time and funds invested in enlisted personnel from initial procurement through appropriate basic training for 28 ratings and advancement and/or specialized training for 171 Navy Enlisted Classification Codes.

Proposed Content of an Officer Personnel Cost Model. PRL Report No. WRM 67-31, Washington, D. C., April 1967. R. Gettings. DDC No. AD 651 883.

This report presents an outline of a proposed Officer personnel cost model. The need to develop such a computerized cost model has become evident with the increasing number of requests for cost data from a wide variety of Navy and Department of Defense offices. The Secretary of Defense has, accordingly, designated the Secretary of the Navy to develop the cost model to be used in design trade-offs.

The approach has involved an analysis of the present Officer personnel cost system in terms of input,processing and output. Revised outputs have been designed to provide concise reports of information frequently required.

Modification to present reporting systems and development of new reporting systems will be required for the implementation of the proposed model.

Some recommendations are made for areas of future research.

On the Job Training Costs: An Analysis. PRL Report No. WRM 67-52, Washington, D. C., June 1967. S. A. Arzigian. DDC No. AD 656 581.

This study presents the results of a preliminary investigation of the feasibility of computing on-the-job training costs. For purposes of this study, on-the-job training is that which involves learning or improving job performance under actual working conditions.

At present there is no system within the Navy to "cost out" on-the-job training. Training cost reporting is limited to formal, or school training. The addition of an on-the-job training cost to the school cost (if any) would provide a more "complete" training cost. Training costs play a major part in many personnel management decisions; therefore, a training cost which reflects all the training provided an individual would prove valuable.

A Personnel Cost Data Bank for use in Studies of Cost and Effectiveness. SRM 68-3, August 1967. Marilee N. Connelly. DDC Availability Number, AD-657 941.

The purpose of this study is to develop the structure of a data bank system which will facilitate the acquisition and computation of personnel costs needed for cost/effectiveness predictions. The Navy's need for adequate personnel cost information, especially during the development of new systems, was investigated. Data bank systems and cost models were examined. None, however, could provide predictive, system oriented personnel costs upon which to base function allocation decisions. The concept of using a computerized system for cost acquisition and computation was evaluated and found feasible. Consequently, the structure, contents, and formulae to be used in such a data bank system were derived and are formally proposed within this report. The tasks required to develop the system are delineated.

On the basis of this research, it is recommended that the personnel cost data bank system proposed herein be fully developed as soon as possible. Solutions to the problems of establishing, maintaining, and using the system for system development cycle support should be sought during the time the cost data system is being developed. The system should be implemented, maintained, and used as soon as possible.

Surface Officer Costs Per Man/Year of Operational Assignment - A Preliminary Cost Estimate Employing the SECNAV Retention Task Force Cost Model. WSS 68-12, November 1967. R. E. Willis & R. W. Gettings.

Preliminary estimated costs were derived by application of the SECNAV Retention Task Force Cost model to basic cost data published by the Office of Comptroller, Department of the Navy. The rationale of the model was described and suggestions were made concerning future refinement in its application. The estimated effects of the implementation of SECNAV approved Task Force recommendations on personnel costs in the future are discussed. Comparison of the presently derived costs with previous ones from various sources is made.

Medical Cost Reporting, An Analysis. WRM 68-11, December 1967. Washington, D. C. J. L. Taylor. DDC Availability No. AD 667-738.

The purpose of this Research Memorandum is to identify and evaluate the problem areas associated with the determination of medical costs as incurred by the Department of the Navy for its military personnel. To establish a valid medical cost, individual training cost studies should be completed for HM's, DT's, Medical Corps, Dental Corps, Nurse Corps, Medical Service Corps, and the Chaplain Corps. Currently ten management bureaus are involved with the distribution of funds for Naval Medical Activities. The Bureau of Medicine and Surgery funds approximately 50% of the complete medical budget, and it is the figure which is used in the computation of a per-man year medical cost. A close examination of the current medical accounting system should be undertaken to determine the economic feasibility of establishing one central medical cost reporting agency. This would provide a complete cost of medical services which could then be combined with the training costs and prorated on a per man per year basis to arrive at a more valid cost. Until this has been accomplished, it is recommended that the medical cost reported by the Bureau of Medicine and Surgery be utilized.

Training Time and Costs for Navy Ratings and NEC's. WRM 68-13, Washington, D. C., January 1968. J. N. Clary. DDC Availability No. AD 667 578.

This memorandum reports Fiscal Year 1967 data on enlisted training time and costs to be used as inputs to the Career Premium Computer Program for determining Pro Pay eligibility. Specifically, it presents the training time and funds invested in enlisted personnel from initial procurement through appropriate basic Class "A" training for 79 general and/or service ratings, and advanced and/or specialized training for 707 Navy Enlisted Classification Codes.

LHA Life Cycle Costing: A Methodology. WRM 68-28, Washington, D. C., June 1968. J. L. Taylor.

The purpose of this Research Memorandum is to generate a suggested prototype for Life Cycle Costing of personnel integrated within a specific combative system. It should not be considered a finite methodology; rather it is the first attempt at establishing the total cost of training and maintaining personnel for a selected military unit, the Landing Helicopter Assault Ship (LHA).

Catalog of Personnel Cost Definitions and Concepts for the Derivation of Man/Machine Function Allocation Formulas. SRM 69-8, October 1968. Marilee N. Connelly. DDC Availability Number, AD-678 347.

Concepts relevant to the cost analysis of man/machine function allocation decisions during the design and development of man/machine systems have been presented with definitions, relevant information, and documentation. An extensive bibliography of relevant research has also been presented. This catalog performs several functions: (1) It provides a theoretical basis for the definition of relevant personnel cost analysis parameters; (2) It provides definitions of cost concepts from many sources in the cost analysis literature; and (3) It provides a bibliography of literature relevant to personnel cost analysis, man/machine function allocation, and system design trade offs which may aid other personnel cost analysts.

LHA Life Cycle Costing: A Methodology. WRM 69-14, December 1968. J. L. Taylor. DDC Availability No. AD 681 742.

The purpose of this Research Memorandum is to generate a suggested prototype methodology for Life Cycle Costing of personnel integrated within a specific combative system. It should not be considered a finite methodology; rather it is the first attempt at establishing the total cost of training and maintenance personnel for a selected military unit, the Landing Helicopter Assault Ship (LHA).

Navy Military Manpower Billet Cost Data for Life Cycle Planning Purposes. WSS 70-3, July 1969. J. N. Clary. DDC Availability No. AD 704 090.

Provides Navy military manpower billet cost data for use on an interim basis pending final design, test and make ready of operational use of a total integrated manpower/personnel cost analysis system.

Training Time and Costs for Navy Ratings and NEC's. WSS 69-3, April 1969. N. J. Clary.

Reports FY 68 data on enlisted training time and costs to be used as inputs to the Career Premium Computer Program for determining Pro Pay eligibility. Specifically, it presents the training time and funds invested in enlisted personnel from initial procurement through appropriate basic training for 80 general and/or service ratings and advanced and/or specialized training for 888 Navy Enlisted Classifications (NEC's).

Officer Personnel Costs: Pilots and Naval Flight Officers Procured Through AVROC and OCS Programs. WRM 70-29, May 1970. J. L. Taylor and S. Arzigian. DDC Availability No. AD 708 392.

Presents a personnel costing methodology for officers procured through the Aviation Reserve Officer Candidate and Officer Candidate School Programs who participate in Pilot and Naval Flight Officer programs. The costs presented in this report were aggregated by program (OCS, AVROC) and within program by aircraft type (A4, A6A, etc.), and further by type of duty (pilot, navigator, etc.).

The Manpower Cost Implications Associated with Changes in Navy Reenlistment Rates: A Methodology. WRM 71-2, July 1970. G. L.Henry. DDC Availability No. AD 710 392.

This is the first report on the progress achieved in developing a methodology which will provide a practical means for calculating and displaying cost implications associated with changing Navy reenlistment rates.

Training Time and Costs for Navy Ratings and NEC's. WOS 71-1, July 1970. J. N. Clary. DDC Availability No. AD 711 315.

Reports FY 69 data on enlisted training and costs to be used as inputs to the Career Premium Computer Program for determining Pro Pay eligibility. Specifically, it presents the training time and funds invested in enlisted personnel from initial procurement through appropriate basic training for 80 general and/or service ratings and advanced and/or specialized training for 1,067 Navy Enlisted Classifications (NEC's) by source ratings.

Determination of Manpower Cost Implications Associated with Changes in Navy Reenlistment Rates. WRM 71-30, March 1971. G. L. Henry. DDC Availability No. AD 724 657.

This is the second, and final, report of a study in which: (1) a practical means for calculating and displaying cost implications associated with changing Navy reenlistment rates was developed, and (2) the developed methodology was employed to calculate reenlistment cost implications associated with 1% changes in FY 72 first and second term reenlistment rates for each Navy enlisted rating.

Officer Personnel Costs: OCS, AOC, AVROC, NAVCAD, NROTC-C, NROTC-R, and Naval Academy. WOS 71-4, March 1971. J. N. Clary & J. T. Creaturo. DDC Availability No. AD 721 331.

The purpose of the report was to present up-to-date training and procurement cost data for various Navy officer programs such as: OCS, AOC, AVROC, NAVCAD, NROTC-C, NROTC-R, and Naval Academy. The data is presented in three appendices: (A - Surface, Submarine, Nuclear Power - Naval Academy, NROTC-R/NROTC-C/OCS Cost Service Comparison) (B - Pilot Cost Comparison) (C - Naval Flight Officer Cost Comparison).

Determination of an Optimal Recruiting-Selection Strategy to Fill a Specified Quota of Satisfactory Personnel. WRM 71-34, April 1971. W. A. Sands. DDC Availability No. AD 723 569.

Managers of military and civilian personnel systems justifiably demand an estimate of the payoff, in dollars and cents, which can be expected to result from the implementation of a proposed selection program.

The Cost of Attaining Personnel Requirements (CAPER) Model provides an optimal recruiting-selection strategy for personnel decisions which minimizes the total cost of recruiting, selecting, inducting, and training a sufficient number of persons to meet a specified quota of satisfactory personnel.

The CAPER Model appears to be a promising personnel management tool. The output, numbers of men and dollar costs, is readily understood by everyone, unlike various statistical indexes popular among psychologists (e.g., validity coefficients). By requiring an explicit estimate of various types of costs, the model decreases the likelihood that policy decisions will be based upon implicit, unrecognized and unwarranted assumptions. Finally, the CAPER Model enables the personnel manager to readily adapt his selection strategy to changes in quota and/or alterations in the recruiting environment.

Utilization Costs of Capital Resources Used by Navy Training Schools: A Methodology. WRM 71-44, June 1971. R. B. Wethy & A. Bumbak. DDC Availability No. AD 727 102.

This is a research study which developed a methodology for costing capital resource utilization (real property) by Navy training schools. The methodology was applied in several examples demonstrating the capability of the utilization cost methodology to provide Navy training school managers at all levels with a more realistic and representative total training cost.

Application of the Cost of Attaining Personnel Requirements (CAPER) Model. WTB 72-1, August 1971. W. A. Sands. DDC Availability No. AD 730 706.

Managers of military and civilian personnel systems justifiably demand an estimate of the payoff, in dollars and cents, which can be expected to result from the implementation of a proposed selection program.

The Cost of Attaining Personnel Requirements (CAPER) Model provides an optimal recruiting-selection strategy for personnel decisions which minimizes the total cost of recruiting, selecting, inducting, and training a sufficient number of persons to meet a specified quota of satisfactory personnel.

This report provides a detailed explanation of the steps involved in utilizing the CAPER Model with, or without, access to computer facilities. A FORTRAN II computer program, including detailed documentation, is presented. This program is designed for a small computer system.

Optimized Cost Benefits Associated with Changes in Officer Retention: A Methodology. WRM 72-30, June 1972. G. L.Henry & R. B. Wethy. DDC Availability No. AD 744 931.

Approximately 5,400 active duty Navy officers and 43,000 officer losses over a 10 year period were analyzed in order to develop a methodology for determining officer retention cost effectiveness. Officer investment cost data were developed for unrestricted line officers of the regular Navy and Naval Reserve assigned to surface, submarine and aviation duties in ranks of lieutenant commander and below who entered the Navy through the Naval Academy, Naval Reserve Officers Training Corps, Officer Candidate School, Aviation Officer Candidate program, or Naval Aviation Cadet program. The methodology is based upon the proposition that officer retention cost effectiveness can be predicated upon the relationship of established minimum service requirements (MSR) versus officer investment costs as developed in the study. It is designed to produce cost data that could be used, for example, in determining officer retention incentive bonuses; in determining the impact of early release or delayed release of officers on officer training investment thereby establishing criteria for such programs; as a consideration in officer procurement programs; and in establishing and adjusting MSR's for various categories of officers. Some examples of uses of the methodology are given using historical officer strength/loss data.

A Bivariate Normal Version of the Cost of Attaining Personnel Requirements Model. WTR 73-18, April 1973. W. A. Sands. DDC Availability No. AD 759 023.

Managers of military and civilian personnel systems justifiably demand an estimate of the payoff in dollars and cents which may be expected to result from the implementation of a proposed selection program.

The Cost of Attaining Personnel Requirements (CAPER) models provide the manager with the information needed to formulate an optimal personnel recruiting-selection strategy. This strategy will minimize the expected total cost of recruiting, selecting, inducting (processing), and training a sufficient number of persons to meet a specified quota of satisfactory personnel.

The original version of the model (CAPER I) employs raw data and evaluates the experimental selection strategy at each possible cutting score on the new selection test. The data preparation task for this version of the model is tedious.

The purpose of this report is to introduce a bivariate normal version of the model (CAPER II). The CAPER II model requires more statistical assumptions than the original model, but drastically reduces the work involved in input data preparation.

A Handbook for the Bivariate Normal Version of the Cost of Attaining Personnel Requirements (CAPER) Model. WTR 73-19, April 1973. W. A. Sands. DDC Availability No. AD 759 358.

Managers of military and civilian personnel systems justifiably demand an estimate of the payoff, in dollars and cents, which may be expected to result from the implementation of a proposed selection program.

The Cost of Attaining Personnel Requirements (CAPER) models provide the manager with the information needed to formulate an optimal personnel recruiting-selection strategy. This strategy will minimize the expected total cost of recruiting, selecting, inducting (processing), and training a sufficient number of persons to meet a specified quota of satisfactory personnel.

This report provides a detailed explanation of the steps involved in using the CAPER II model with, or without, access to computer facilities. Application of the model equations is illustrated using an example problem. A FORTRAN IV computer program including detailed documentation is presented.

BIBLIOGRAPHY REPORTS

Abstracts of Technical Reports, January 1962 - June 1964. July 1964, 44 pp. (SD)

Abstracts of Technical Reports, July 1964 - June 1965. SRR 65-8, September 1965, 34 pp.

Bibliography of Technical Reports (FY 1965). October 1965, 13 pp. (W)

Abstracts of Technical Reports, July 1965 - June 1966. SRR 66-26, September 1966, 43 pp.

Bibliography and Abstracts of Technical Reports, July 1965 to June 1966. WRR 67-1, January 1967, 26 pp.

Abstracts of Technical Reports, July 1966 - June 1967. SRR 67-18, September 1967, 32 pp.

Bibliography and Abstract of Technical Reports, July 1966 to June 1967. WRR 68-2, October 1967, 36 pp.

Annotated Bibliography of Reports and Related Publications of Personnel Systems Research Department, June 1965 to July 1967. November 1967, 38 pp. (W)

Abstracts of Technical Reports - Personnel Surveys Division, January 1965 - January 1968. WRR 68-12, February 1968, 18 pp.

Abstracts of Technical Reports, July 1967 - June 1968. SRR 68-26, August 1968, 43 pp.

Bibliography and Abstract of Technical Reports, July 1967 to June 1968. WRR 69-1, October 1968, 50 pp.

Abstracts of Reports - Motivational and Survey Research Division (October 1964 - May 1969). July 1969, 30 pp. (W)

Abstracts of Technical Reports, July 1968 - June 1969. SRR 69-29, September 1969, 38 pp.

Bibliography and Abstract of Technical Reports, July 1968 to June 1969. WRR 70-4, October 1969, 30 pp.

Abstracts of Technical Reports, July 1969 - June 1970. SRR 70-35, September 1970, 54 pp.

BIBLIOGRAPHY REPORTS (Continued)

Bibliography and Abstract of Technical Reports, July 1969 to June 1970. WRR 71-2, October 1970, 46 pp.

Abstracts of Technical Reports, July 1970 - June 1971. SRR 71-30, November 1971, 42 pp.

Bibliography and Abstract of Technical Reports, July 1970 to June 1971. WRR 72-3, November 1971, 46 pp.

Abstracts of Technical Reports, July 1971 - June 1972. SRR 72-27, August 1972, 47 pp.

Bibliography and Abstract of Technical Reports, July 1971 to June 1972. WTR 73-8, September 1972, 46 pp.

Abstracts of Reports - Attitude and Motivation Research Program. WTR 73-27, May 1973, 62 pp.

Abstracts of Technical Reports, July 1972 - June 1973. June 1973. (SD)

Bibliography and Abstract of Technical Reports, July 1972 to June 1973. WTR 73-39, June 1973, 40 pp.

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